

## SPECIFICATION

Part No. : **AA.162.301111**

Product Name : Ulysses Ultra-Low Profile Miniature Magnet  
Mounted GPS-GLONASS-GALILEO Antenna

Feature : 1575MHz – 1610MHz  
1.8-5.5V  
3m RG174 SMA(M)  
IP67 Rated  
Dims: 40\*38\*10mm  
Custom cables and connectors available  
RoHS Compliant



## **1. Introduction**

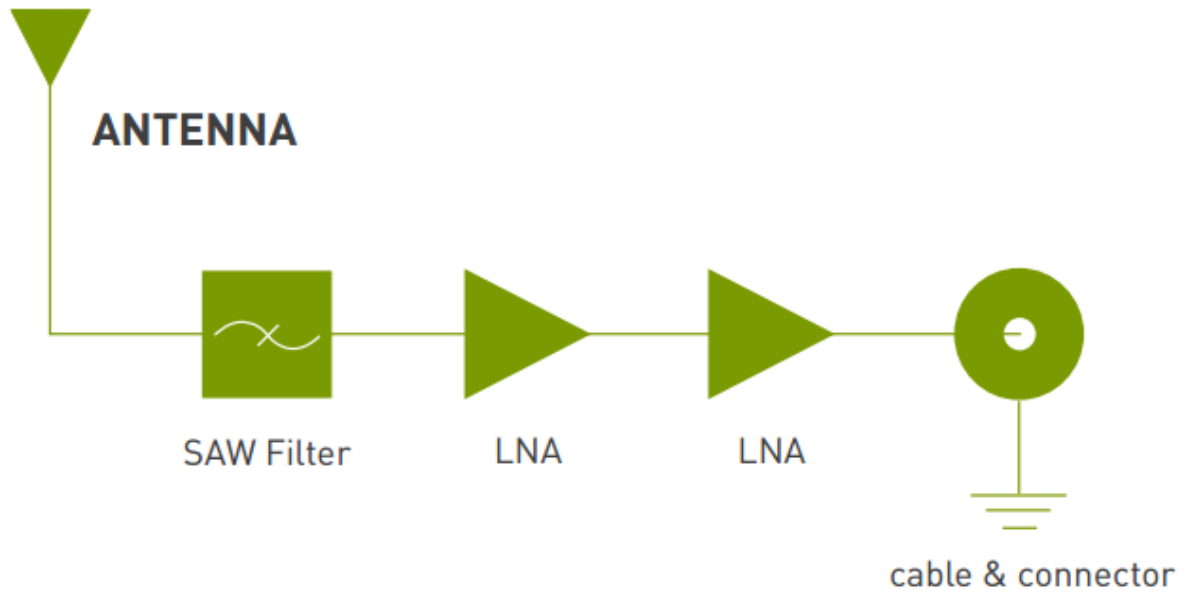
The Ulysses miniature super low profile (only 10mm in height) GNSS antenna is designed for applications which require high positioning accuracy by combining signals from GPS, GALILEO and GLONASS systems. A high gain wide-band patch antenna on an integral ground delivers reliable performance. Fully IP67 waterproof rating allows use in outdoors environments. Front end SAW filter configuration eliminates potential LNA burn-out from nearby out of band radiated power bursts from other antennas that may be co-located nearby.

The antenna is manufactured to strict first tier Automotive quality controlled manufacturing process in TS16949 approved facility.

## 2. Specification

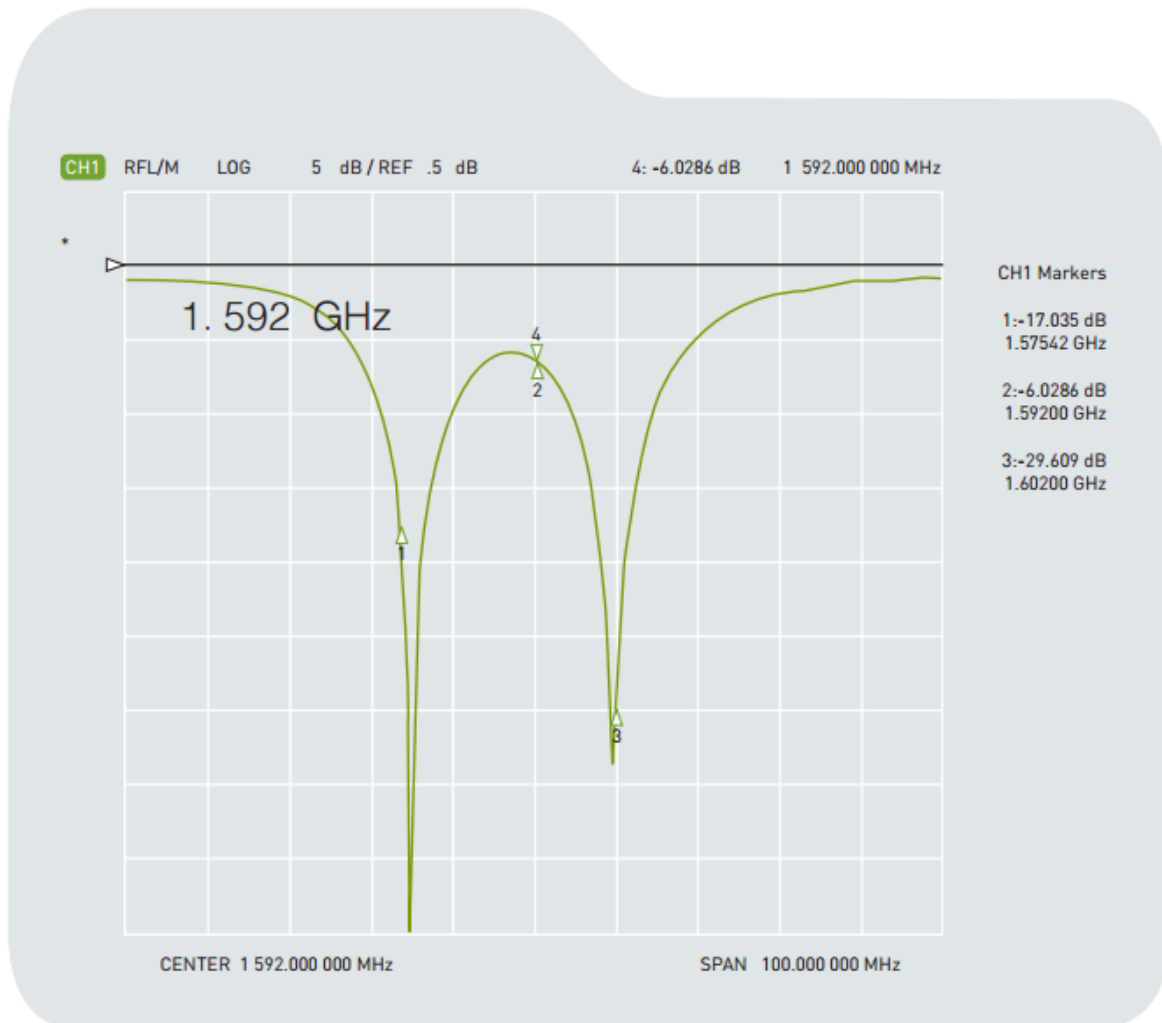
| ELECTRICAL                            |                                                               |             |             |
|---------------------------------------|---------------------------------------------------------------|-------------|-------------|
| Centre Frequency                      | 1575~1610MHz                                                  |             |             |
| Antenna Gain                          | 26±3dBic @ zenith @ 1575.42MHz<br>27±3dBic @ zenith @ 1602MHz |             |             |
| VSWR                                  | 2.0 max.                                                      |             |             |
| Impedance                             | 50Ω                                                           |             |             |
| Outer Band Attenuation                | 1592±140MHz 15dB Min                                          |             |             |
| Pout at 1dB Gain<br>Compression Point | -6dBm Min. -2dBm Typ.                                         |             |             |
| DC input                              | 1.8V (min.)                                                   | 3.0V (typ.) | 5.5V (max.) |
| LNA Gain                              | 22dB                                                          | 28dB        | 31dB        |
| Noise Figure                          | 2.6dB                                                         | 2.6dB       | 2.9dB       |
| Power Consumption                     | 5mA                                                           | 10mA        | 23mA        |
| MECHANICAL                            |                                                               |             |             |
| Antenna Dimensions                    | 37.8 x 40.4 x 10mm                                            |             |             |
| Housing Material                      | UV Resistant ABS                                              |             |             |
| Cable                                 | 3m RG174 (fully customizable)                                 |             |             |
| Connector                             | SMA(M) (fully customizable)                                   |             |             |
| ENVIRONMENTAL                         |                                                               |             |             |
| Operation Temperature                 | -40°C to 85°C                                                 |             |             |
| Storage Temperature                   | -40°C to 85°C                                                 |             |             |
| Relative Humidity                     | 40% to 95%                                                    |             |             |

### 3. Antenna Block Diagram



## 4. Antenna S11 Property

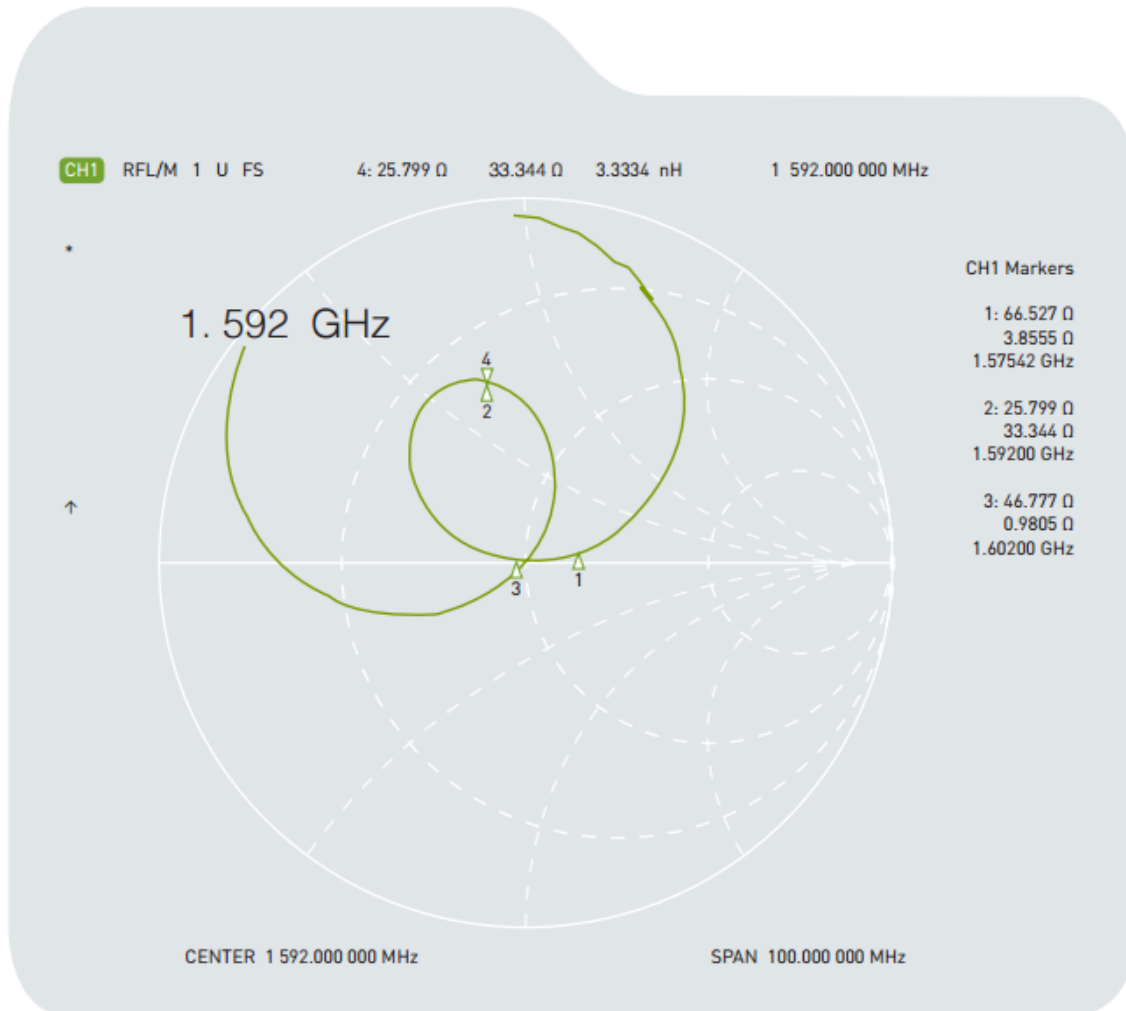
### 4.1. Return Loss



#### Return Loss

-17.03 dB @ 1575MHz  
-29.60 dB @ 1602MHz

## 4.2. Impedance

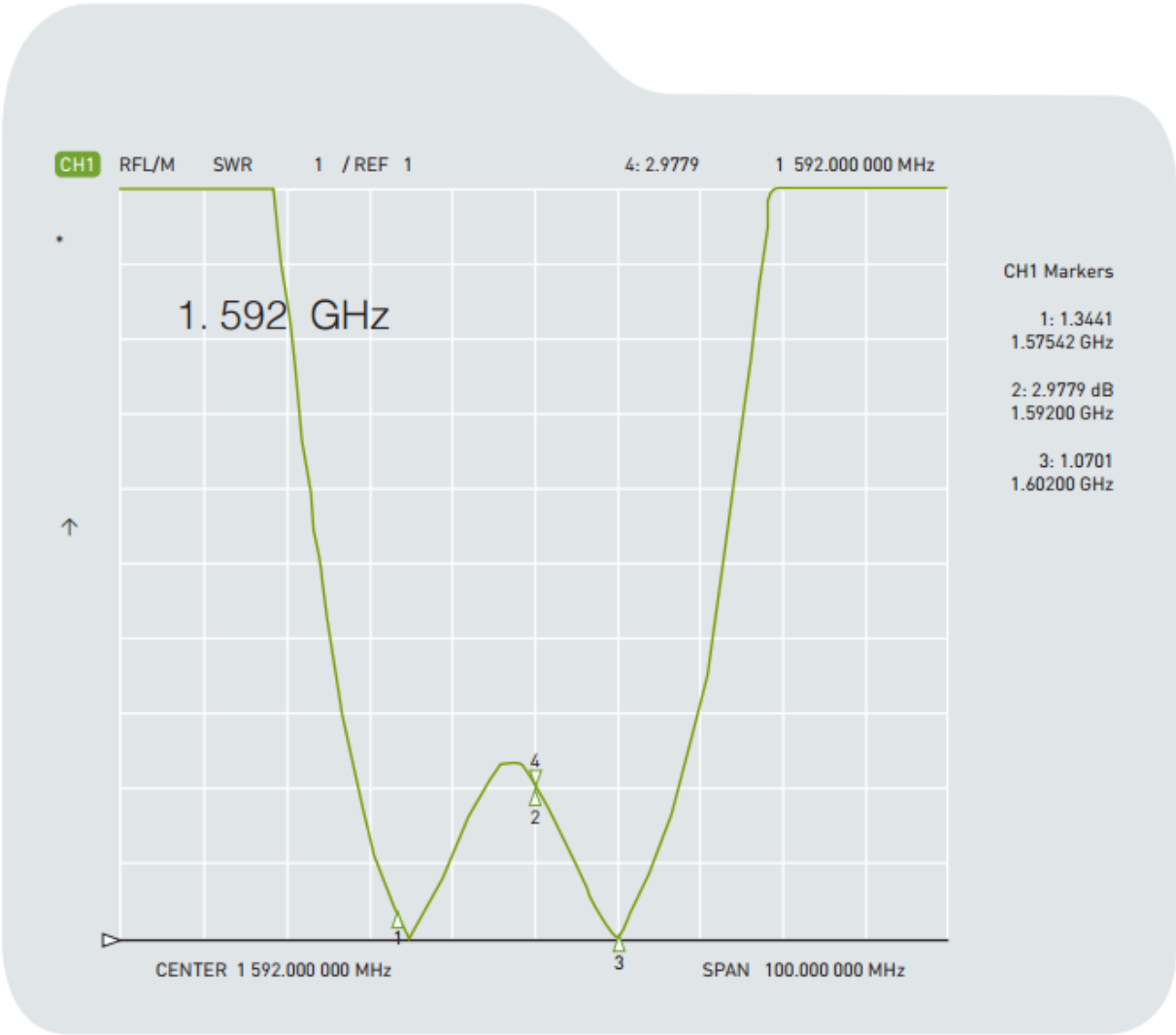


**Impedance :**

66.52 +j3.85 Ohm@ 1575MHz

46.77 +j0.98 Ohm@ 1602MHz

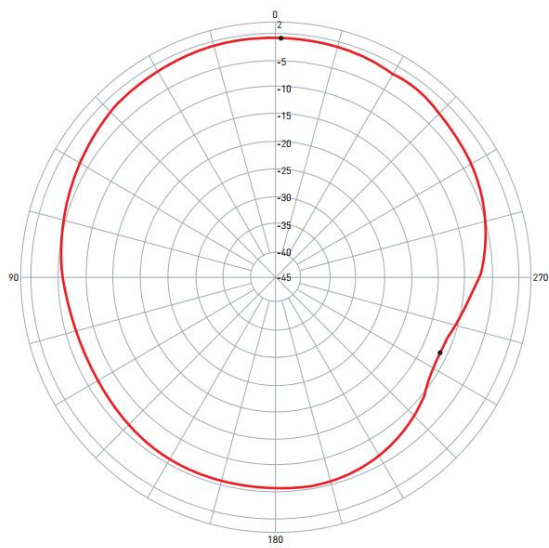
4.3. VSWR



| VSWR           |
|----------------|
| 1.34 @ 1575MHz |
| 1.07 @ 1602MHz |

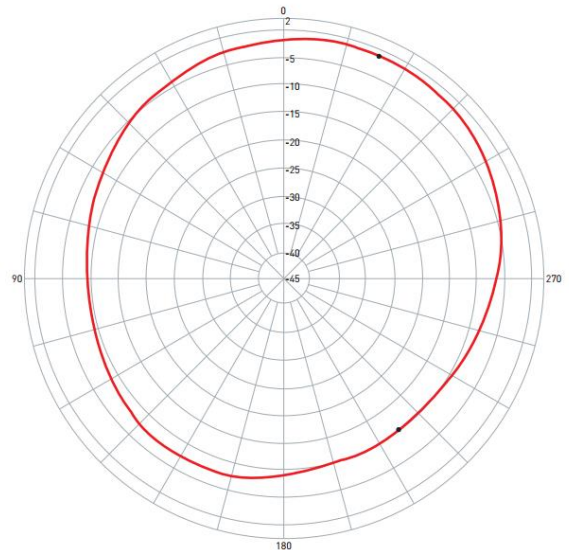
## 5. Radiation Patterns

1575.42MHz XZ Plane



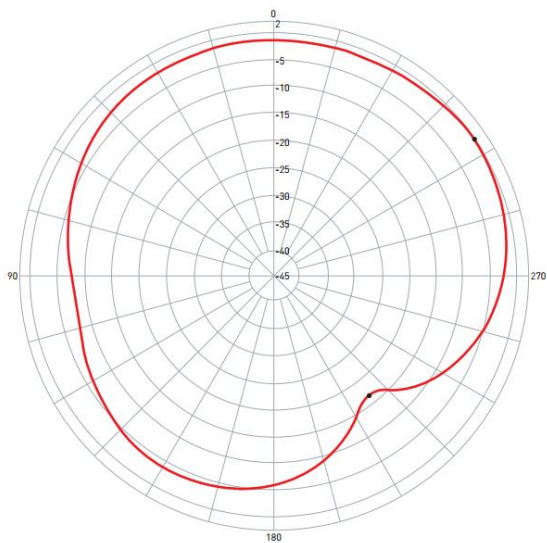
| Pattern | Model No.     | Test Mode | Freq (MHz) | Max Gain(dBi)  | Min Gain(dBi)   | Avg. Gain(dBi) | Source Polar. |
|---------|---------------|-----------|------------|----------------|-----------------|----------------|---------------|
| 1       | AA.162.301111 | XZ        | 1575.42    | -0.69 / 359.00 | -11.62 / 245.00 | -4.12          | V+H           |

1575.42MHz YZ Plane



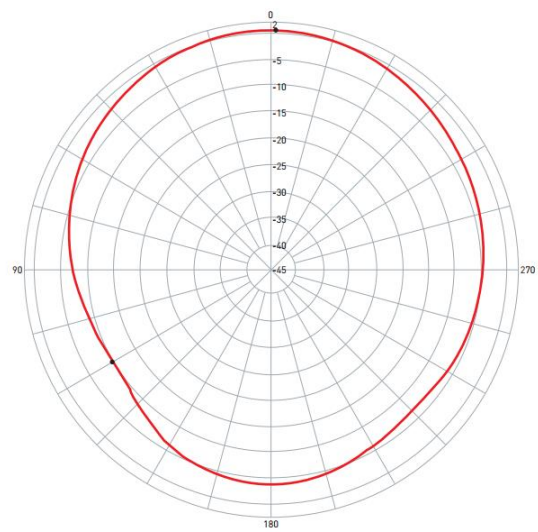
| Pattern | Model No.     | Test Mode | Freq (MHz) | Max Gain(dBi)  | Min Gain(dBi)   | Avg. Gain(dBi) | Source Polar. |
|---------|---------------|-----------|------------|----------------|-----------------|----------------|---------------|
| 1       | AA.162.301111 | YZ        | 1575.42    | -1.15 / 337.00 | -10.60 / 217.00 | -5.28          | V+H           |

1602MHz XZ Plane



| Pattern | Model No.     | Test Mode | Freq (MHz) | Max Gain(dBi)  | Min Gain(dBi)   | Avg. Gain(dBi) | Source Polar. |
|---------|---------------|-----------|------------|----------------|-----------------|----------------|---------------|
| 1       | AA.162.301111 | XZ        | 1602.00    | -0.34 / 304.00 | -16.71 / 218.00 | -3.63          | V+H           |

1602MHz YZ Plane



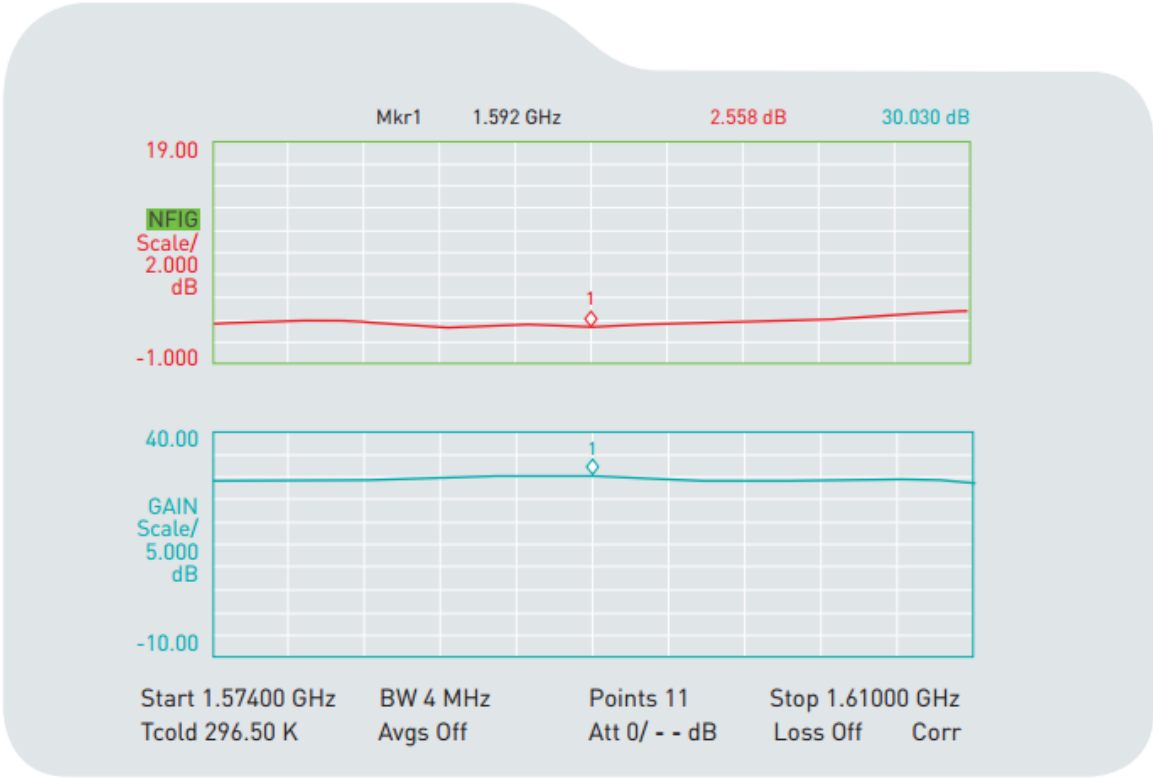
| Pattern | Model No.     | Test Mode | Freq (MHz) | Max Gain(dBi) | Min Gain(dBi)   | Avg. Gain(dBi) | Source Polar. |
|---------|---------------|-----------|------------|---------------|-----------------|----------------|---------------|
| 1       | AA.162.301111 | YZ        | 1602.00    | 0.49 / 359.00 | -10.13 / 120.00 | -3.46          | V+H           |

## 6. LNA Gain and Output Band Rejection @3.0V

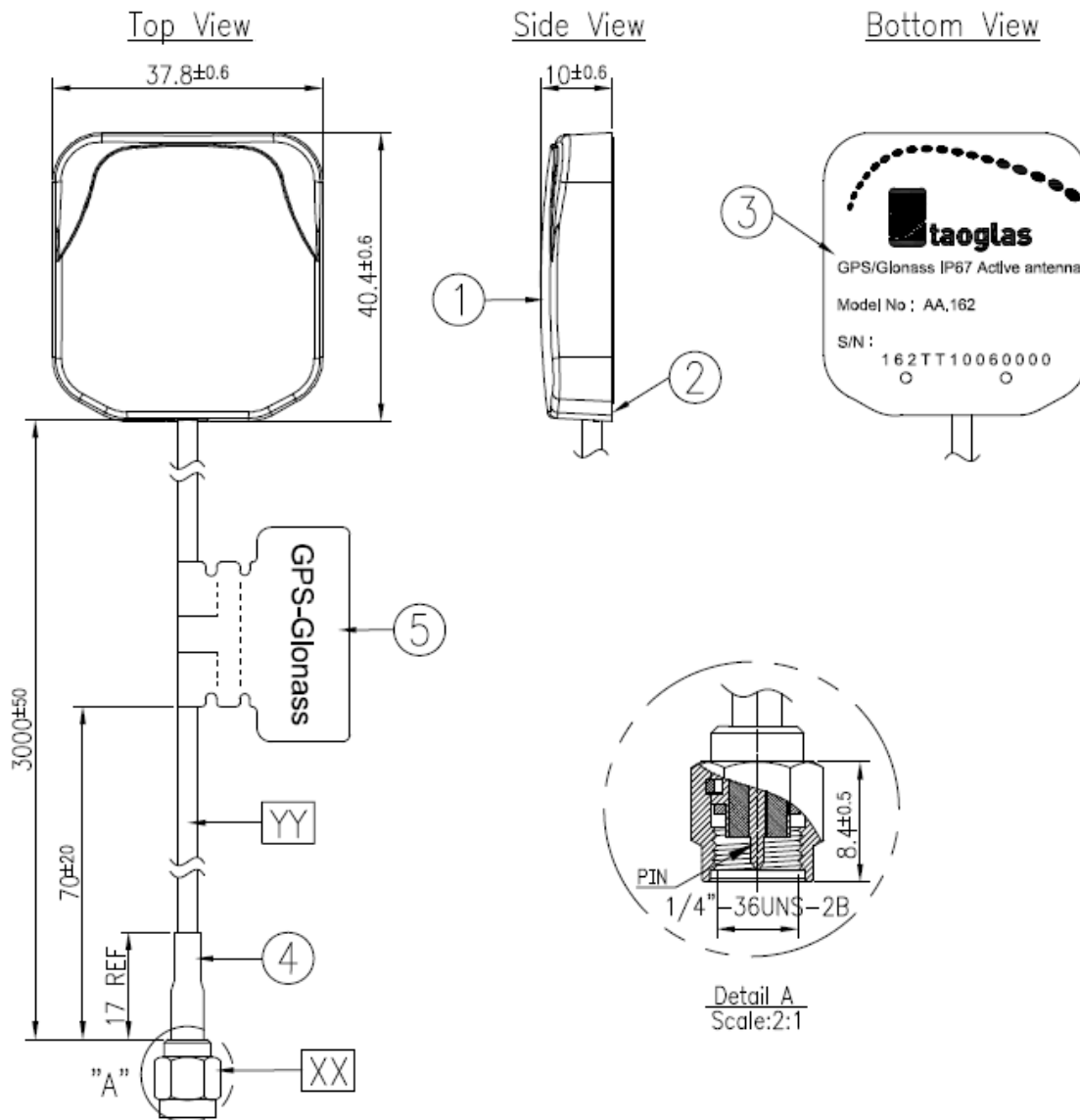


|             |    |               |            |
|-------------|----|---------------|------------|
| Ch1 Tr1 S21 | 1  | 1.5740000 GHz | 28.186 dB  |
| Ch1 Tr1 S21 | >2 | 1.6100000 GHz | 27.949 dB  |
| Ch1 Tr1 S21 | 3  | 1.5920000 GHz | 29.044 dB  |
| Ch1 Tr1 S21 | 4  | 1.5420000 GHz | 9.0245 dB  |
| Ch1 Tr1 S21 | 5  | 1.6420000 GHz | -10.035 dB |
| Ch1 Tr1 S21 | 6  | 1.4920000 GHz | 4.4105 dB  |
| Ch1 Tr1 S21 | 7  | 1.6920000 GHz | -14.431 dB |
| Ch1 Tr2 S21 | 1  | 1.5740000 GHz | 1.0816     |
| Ch1 Tr2 S21 | 2  | 1.6100000 GHz | 1.1855     |
| Ch1 Tr2 S21 | 3  | 1.5920000 GHz | 1.2488     |
| Ch1 Tr2 S21 | 4  | 1.5420000 GHz | 1.3486     |

7. LNA Noise Figure @3.0V



## 8. Drawing



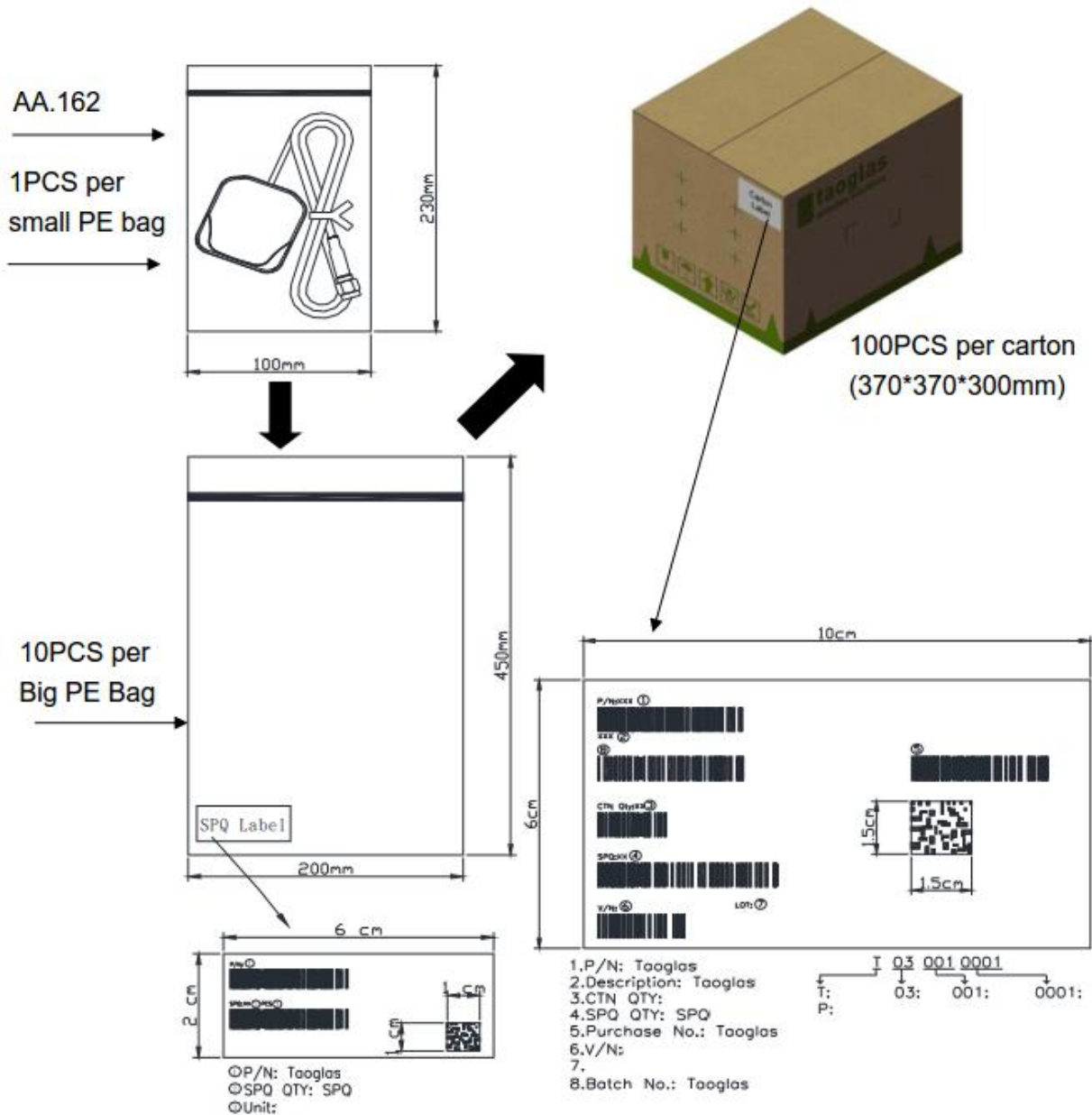
### NOTES:

1. All Material Must Be RoHS Compliant.

|   | Name              | P/N            | Material         | Finish | QTY |
|---|-------------------|----------------|------------------|--------|-----|
| 1 | Housing Top       | 000116K000000A | ABS              | Black  | 1   |
| 2 | Housing Bottom    | 000116K010000A | ABS              | Black  | 1   |
| 3 | Sticker           | 001016K000000A | Gloss Silver PET | Silver | 1   |
| 4 | Heat Shrink Tube  | 001315C020000A | PE               | Black  | 1   |
| 5 | GPS-Glonass Label | 001012K010051A | PEPA             | Orange | 1   |

|    | Name           | P/N            | Spec     | Finish    | QTY |
|----|----------------|----------------|----------|-----------|-----|
| XX | Connector Type | 200216D00009BA | SMA(M)ST | Au Plated | 1   |
| YY | Cable Type     | 301315C000000A | RG-174   | Black     | 1   |

## 9. Packaging



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