### Ulysses
#### AA.162.301111

**Specification**

<table>
<thead>
<tr>
<th>Part No.</th>
<th>AA.162.301111</th>
</tr>
</thead>
</table>
| **Product Name** | **Ulysses**  
Ultra-Low Profile Miniature Magnet Mounted  
GPS-GLONASS Antenna |
| **Feature** | 1575MHz – 1610MHz  
40mm*38mm*10mm  
1.8-5.5V  
3m RG174 SMA(M)  
IP67 Rated  
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 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**: 1574~1610MHz
- **Antenna Gain**: 26 ± 3dBic @ Zenith @ 1575.42MHz
  - 27 ± 3dBic @ Zenith @ 1602MHz
- **VSWR**: 2.0 max.
- **Impedance**: 50Ω
- **Outer Band Attenuation**: 1592±140MHz 15dB Min
- **Pout at 1dB Gain 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 105°C
- **Relative Humidity**: 40% to 95%
3. Antenna Block Diagram

ANTENNA

SAW Filter → LNA → LNA

cable & connector
4. Antenna S11 Property

4.1 Return Loss

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

**Impedance:**

1: 66.527 Ω + 3.8555 Ω @ 1.57542 GHz

2: 25.799 Ω + 33.344 Ω @ 1.59200 GHz

3: 46.777 Ω + 0.9805 Ω @ 1.60200 GHz
4.3 VSWR

**VSWR**

1.34 @ 1575MHz
1.07 @ 1602MHz
5. Radiation Patterns

1575.42MHz XZ Plane

<table>
<thead>
<tr>
<th>Pattern</th>
<th>Model No.</th>
<th>Test Mode</th>
<th>Freq (MHz)</th>
<th>Max Gain(dBi)</th>
<th>Min Gain(dBi)</th>
<th>Avg. Gain(dBi)</th>
<th>Source Polar.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>AA.162.301111</td>
<td>XZ</td>
<td>1575.42</td>
<td>-0.69 / 359.00</td>
<td>-11.62 / 245.00</td>
<td>-4.12</td>
<td>V+H</td>
</tr>
</tbody>
</table>
### 1575.42MHz YZ Plane

<table>
<thead>
<tr>
<th>Pattern</th>
<th>Model No.</th>
<th>Test Mode</th>
<th>Freq (MHz)</th>
<th>Max Gain(dBi)</th>
<th>Min Gain(dBi)</th>
<th>Avg. Gain(dBi)</th>
<th>Source Polar.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>AA.162.301111</td>
<td>YZ</td>
<td>1575.42</td>
<td>-1.15 / 337.00</td>
<td>-10.60 / 217.00</td>
<td>-5.28</td>
<td>V+H</td>
</tr>
</tbody>
</table>
1602MHz XZ Plane

<table>
<thead>
<tr>
<th>Pattern</th>
<th>Model No.</th>
<th>Test Mode</th>
<th>Freq (MHz)</th>
<th>Max Gain(dBi)</th>
<th>Min Gain(dBi)</th>
<th>Avg. Gain(dBi)</th>
<th>Source Polar.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>AA.162.301111</td>
<td>XZ</td>
<td>1602.00</td>
<td>-0.34 / 304.00</td>
<td>-16.71 / 218.00</td>
<td>-3.63</td>
<td>V+H</td>
</tr>
</tbody>
</table>
1602MHz YZ Plane

<table>
<thead>
<tr>
<th>Pattern</th>
<th>Model No.</th>
<th>Test Mode</th>
<th>Freq (MHz)</th>
<th>Max Gain(dBi)</th>
<th>Min Gain(dBi)</th>
<th>Avg. Gain(dBi)</th>
<th>Source Polar.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>AA.162.301111</td>
<td>YZ</td>
<td>1602.00</td>
<td>0.49 / 359.00</td>
<td>-10.13 / 120.00</td>
<td>-3.46</td>
<td>V+H</td>
</tr>
</tbody>
</table>
6. LNA Gain and Out Band Rejection @3.0V

**Tr1 S21 Log Mag 10.00dB/ Ref 0.000dB [F2 Smo]**

**Tr2 S22 SWR 1.000 / Ref 1.000 [F2 Smo]**

<table>
<thead>
<tr>
<th>Ch1</th>
<th>Tr1 S21</th>
<th>1</th>
<th>1.5740000 GHz</th>
<th>28.186 dB</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ch1</td>
<td>Tr1 S21</td>
<td>&gt;2</td>
<td>1.6100000 GHz</td>
<td>27.949 dB</td>
</tr>
<tr>
<td>Ch1</td>
<td>Tr1 S21</td>
<td>3</td>
<td>1.5920000 GHz</td>
<td>29.044 dB</td>
</tr>
<tr>
<td>Ch1</td>
<td>Tr1 S21</td>
<td>4</td>
<td>1.5420000 GHz</td>
<td>9.0245 dB</td>
</tr>
<tr>
<td>Ch1</td>
<td>Tr1 S21</td>
<td>5</td>
<td>1.6420000 GHz</td>
<td>-10.035 dB</td>
</tr>
<tr>
<td>Ch1</td>
<td>Tr1 S21</td>
<td>6</td>
<td>1.4920000 GHz</td>
<td>4.4105 dB</td>
</tr>
<tr>
<td>Ch1</td>
<td>Tr1 S21</td>
<td>7</td>
<td>1.6920000 GHz</td>
<td>-14.431 dB</td>
</tr>
<tr>
<td>Ch1</td>
<td>Tr2 S21</td>
<td>1</td>
<td>1.5740000 GHz</td>
<td>1.0816 dB</td>
</tr>
<tr>
<td>Ch1</td>
<td>Tr2 S21</td>
<td>2</td>
<td>1.5920000 GHz</td>
<td>1.1585 dB</td>
</tr>
<tr>
<td>Ch1</td>
<td>Tr2 S21</td>
<td>3</td>
<td>1.5920000 GHz</td>
<td>1.4888 dB</td>
</tr>
<tr>
<td>Ch1</td>
<td>Tr2 S21</td>
<td>4</td>
<td>1.5420000 GHz</td>
<td>1.3486 dB</td>
</tr>
</tbody>
</table>
7. LNA Noise Figure @3.0V

![Graph showing LNA Noise Figure at 3.0V](image)

- **Start Frequency:** 1.57400 GHz
- **Stop Frequency:** 1.61000 GHz
- **Bandwidth (BW):** 4 MHz
- **Average (Avgs):** Off
- **Attenuation (Att):** 0 dB
- **Loss:** Off
- **Correction (Corr):** Off

**Noise Figure (NFIG):**
- **Scale:** 2.000 dB
- **Values:**
  - 19.00 dB
  - 2.558 dB
  - 30.030 dB

**Gain (GAIN):**
- **Scale:** 5.000 dB
- **Values:** 40.00 dB
8. Drawing

**Top**

<table>
<thead>
<tr>
<th>Name</th>
<th>Material</th>
<th>Finish</th>
<th>QTY</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 AA.162 Antenna Housing Top</td>
<td>ABS</td>
<td>Black</td>
<td>1</td>
</tr>
<tr>
<td>2 AA.162 Antenna Housing Bottom</td>
<td>ABS</td>
<td>Black</td>
<td>1</td>
</tr>
<tr>
<td>3 AA.162 Sticker</td>
<td>Gloss Silver PET</td>
<td>Silver</td>
<td>1</td>
</tr>
<tr>
<td>4 Heat Shrink Tube</td>
<td>PE</td>
<td>Black</td>
<td>1</td>
</tr>
<tr>
<td>5 GPS-Glonass Label</td>
<td>Coated Paper</td>
<td>Orange</td>
<td>1</td>
</tr>
</tbody>
</table>

**Side**

<table>
<thead>
<tr>
<th>Name</th>
<th>Material</th>
<th>Finish</th>
<th>QTY</th>
</tr>
</thead>
<tbody>
<tr>
<td>WW Connector Type</td>
<td>SMA(M) ST</td>
<td>Gold</td>
<td>1</td>
</tr>
<tr>
<td>XX Cable Length</td>
<td>3000±50mm</td>
<td>Black</td>
<td>1</td>
</tr>
<tr>
<td>YY Cable Type</td>
<td>RG174</td>
<td>Black</td>
<td>1</td>
</tr>
</tbody>
</table>

**Bottom**

GPS/Glonass IP67 Active antenna
Model No : AA.162
S/N : XXXCT10060001
9. Packaging

1pcs antenna per small PE bag
100pcs antennas per Box

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 © Taoglas Ltd.