

GCA01 v2:

HIGH GAIN COMPACT GNSS ACTIVE PATCH ANTENNA



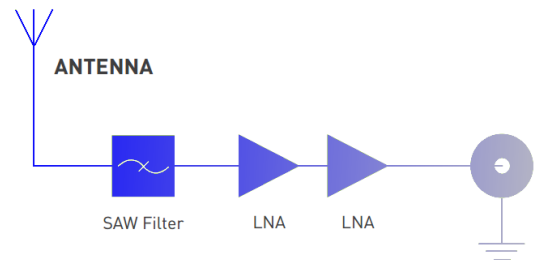
SUMMARY

The EXA GCA01 V2.0 is a 3-stage, high gain (30dB), compact GNSS active patch antenna solution that works with your GNSS card and link it to GPS, GALILEO, BEIDOU and GLONASS constellations, it is the ideal antenna for space-grade GNSS devices to achieve good sensitivity across all bands in a small form factor.

The active patch antenna, by means of a double resonance design, has a wide-band operation over GPS/GLONASS/GALILEO/BeiDou systems from 1561MHz to 1606MHz. It includes a two-stage LNA and front-end SAW filter to reduce out of band noise, this antenna offers better protection from LEO radiation and greatly reduces the probability of damaging your GNSS receiver due to nearby transmissions.

FEATURES

- Flight heritage since 2018
- Active antenna, LNA integrated.
- SAW filter integrated.
- Wide bandwidth: 1561 to 1606 MHz
- Can be mounted inside spacecraft
- Custom choice of connectors.
- Wide FOV of 112 degrees.
- Designed for LEO missions and requirements.
- Manufactured according to NASA and ESA space standards and materials.
- Functional, performance, thermal bake out and vibration tests provided w/documentation.
- Compatible and compliant with standard deployers and CubeSat Standard.



PERFORMANCE

- **Frequencies:**
 - GPS: $1575.42 \pm 1.023\text{MHz}$
 - Galileo: $1575.42 \pm 1.023\text{MHz}$
 - GLONASS: $1602 \pm 4\text{MHz}$
 - BeiDou: $1561.098 \pm 2.046\text{MHz}$.

- Polarization RHCP
- Antenna Gain at Zenith
 - (Ceramic Patch only)
 - GPS/Galileo 1575.42MHz: 1 dBic typ. @zenith
 - GLONASS 1602MHz: 1.1 dBic typ. @zenith
 - BeiDou 1561MHz: 1.2 dBic typ. @zenith
- Total Antenna Gain at Zenith
 - (Antenna+SAW+LNA+Cable+Connector)
 - GPS/Galileo 1575.42MHz: 30 +/- 1.5dBi
 - GLONASS 1602MHz: 30 +/- 2dBi
 - BeiDou 1561MHz: 30 +/- 2.1dBi
- Impedance 50 ohms
- Output VSWR Max 2:1
- Noise figure: <2.4 dB
- **LNA Properties:**
- Frequency range: 1558~1610 MHz.
- Out of Band Rejection
 - 698 MHz >70 dB
 - 960MHz >65 dB
 - 1710MHz >60 dB
 - 2170MHz >65 dB
 - 2400MHz >65 dB
 - 2700MHz >65 dB
- Output Impedance: 50Ω
- Output VSWR 2:0 Max
- Pout at 1dB Gain -6 dBm Min.
- Compression Point -2 dBm Typical
- LNA Gain, Power Consumption and Noise Figure
 - Min 3.3V 30dB 6mA <2.2dB
 - Max 5.5V 31dB 9mA <2.4dB

PRODUCT PROPERTIES

- **Ceramic Dimension:**
 - 25 x 25 x 4mm
- Total Dimension (including shielding case)
 - 30 x 30 x 8 mm

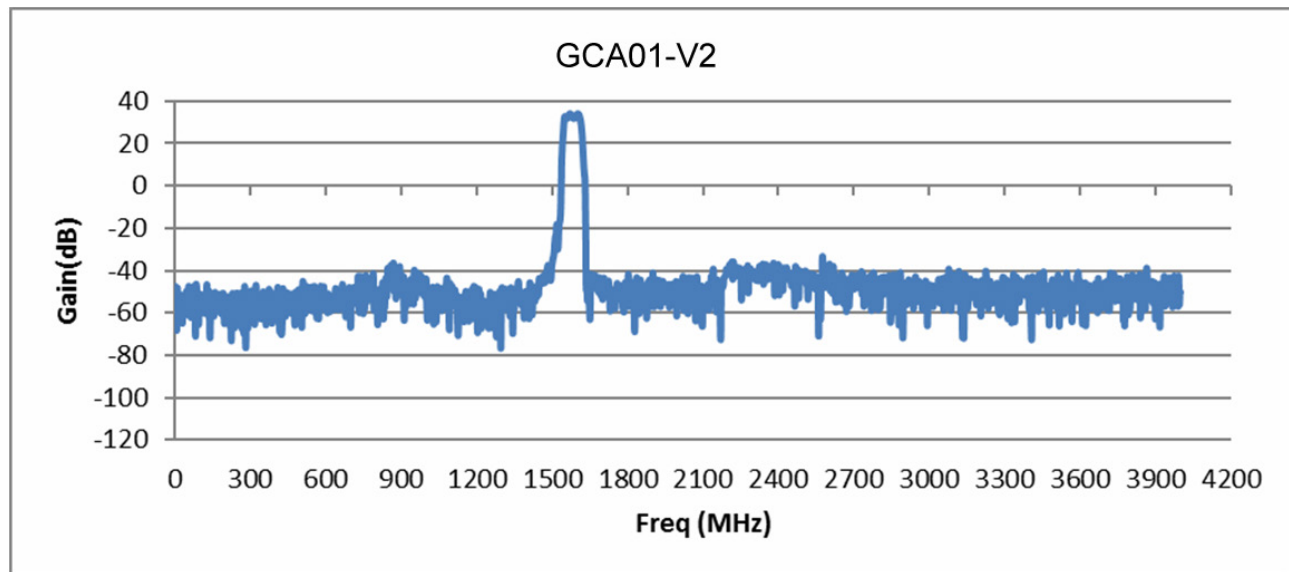
- Connector IPEX MHFI (U.FL) / SMA / MCX / MMCX / MMBX
- **Cable coaxial cable:** Ø1.13, length up to 60mm
- **Mass:** 13.2 grams
- **Operating Temperature:** -40 to +85°C
- **Radiation Tolerance:** 4 years minimum in LEO

MATERIALS

- Only TML and CVCM < 1% materials used, NASA and ESA approved
- Anti AOA coating available
- **Antenna Material:** Ceramic
- **Connector:** SMA, MCX, MMCX, MMBX or U.FL
- PTFE (Teflon) space grade cables, coax, custom choice or RG316, RG174, RG178

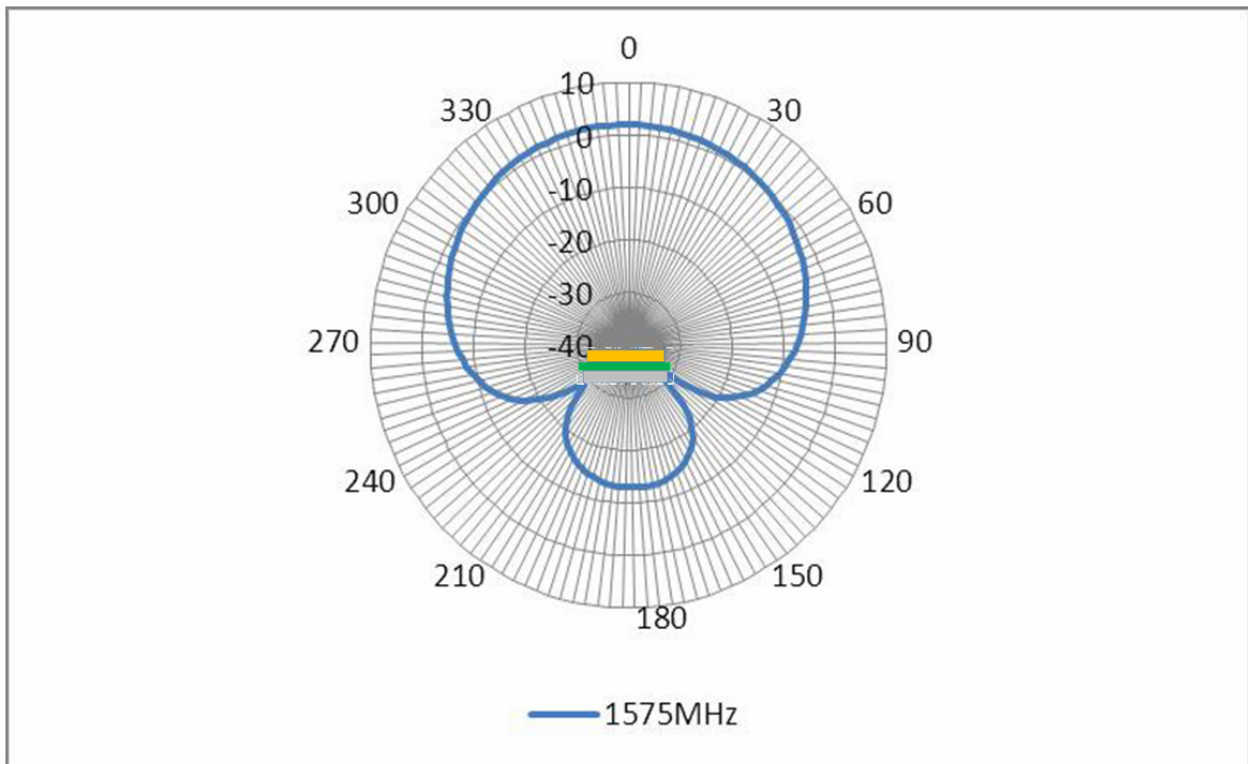
PRODUCT CHARTS

LNA GAIN AND OUT-OF-BAND REJECTION

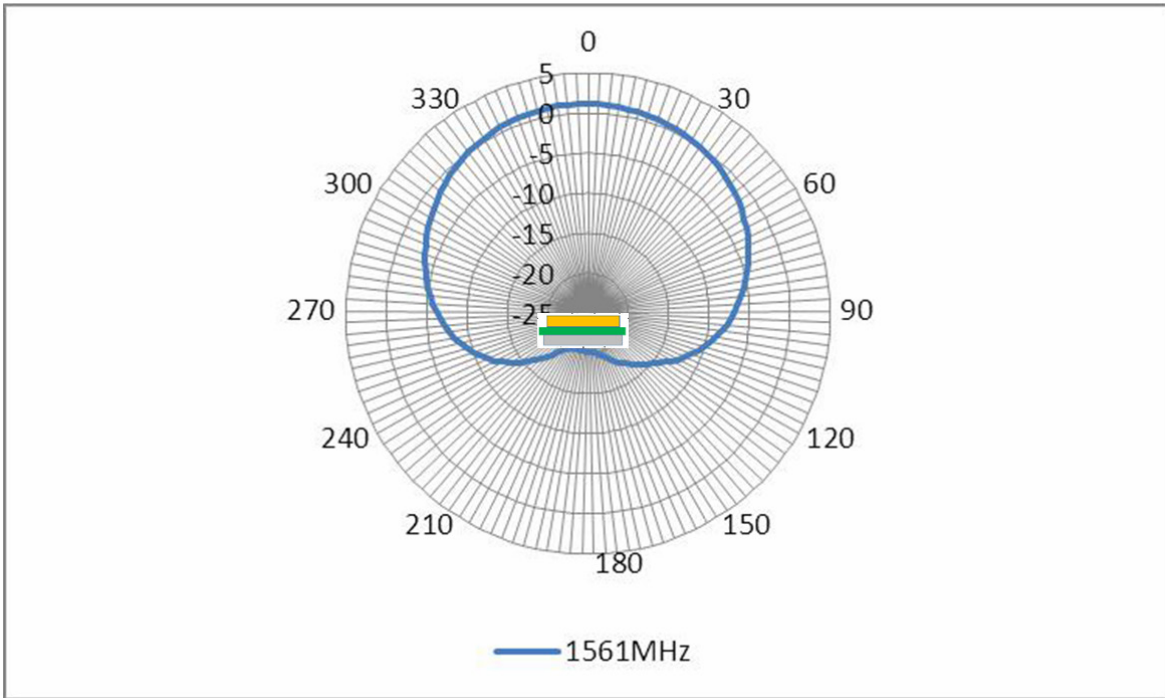


2D RADIATION PATTERNS

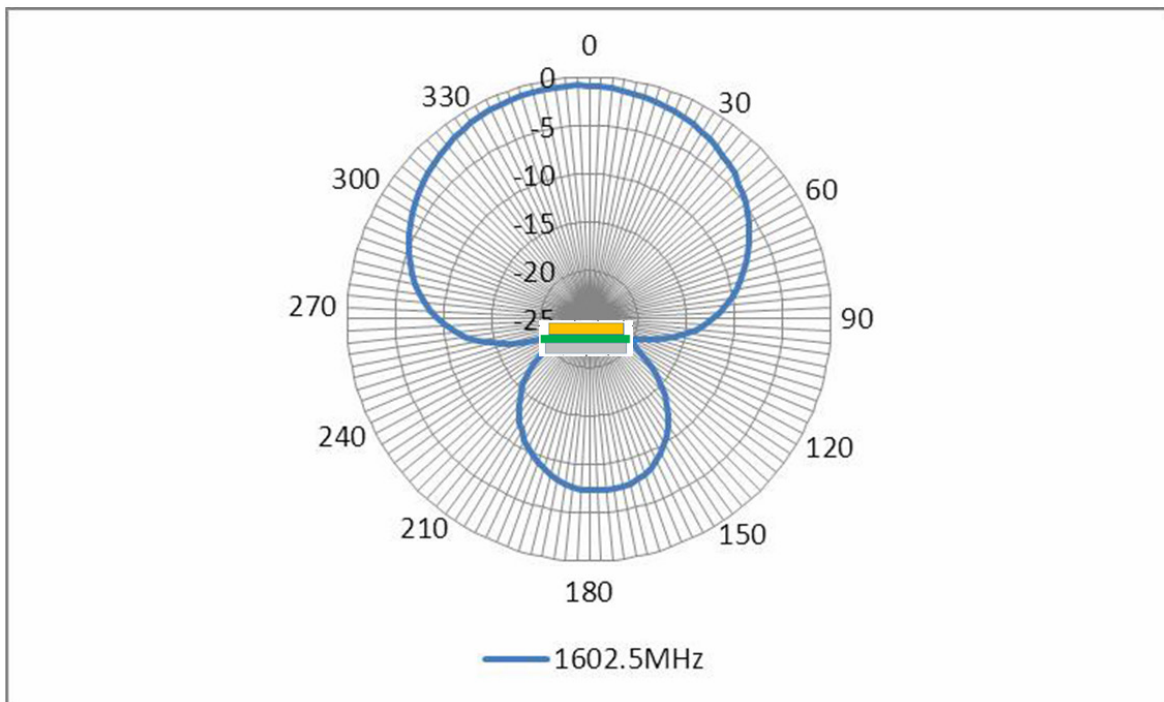
Radiation Pattern (70mm x 70mm ground plane) GPS & Galileo



Radiation Pattern (70mm x 70mm ground plane) BEIDOU

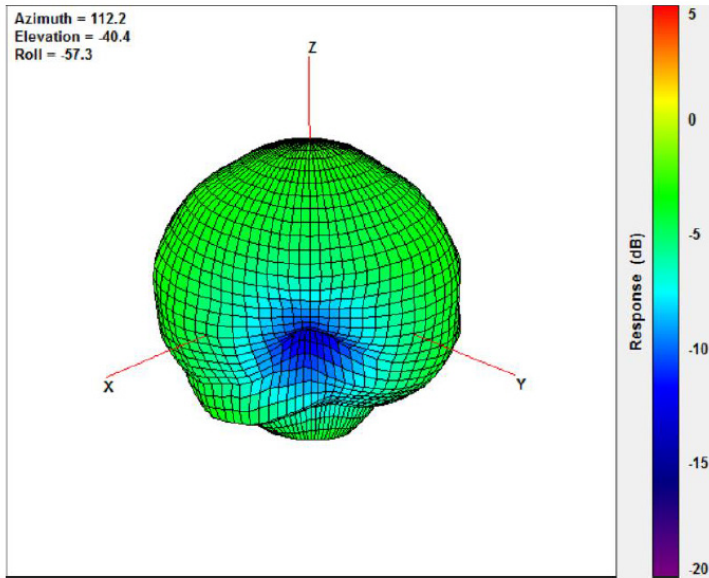


Radiation Pattern (70mm x 70mm ground plane) GLONASS

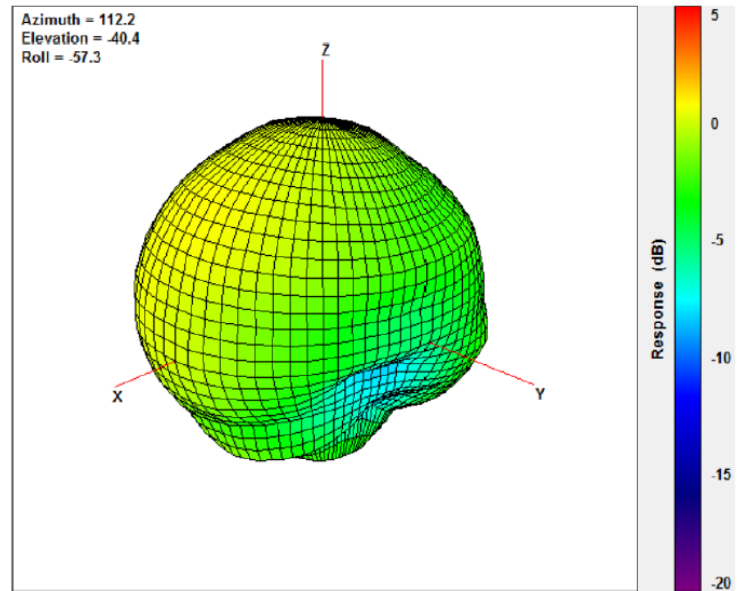


3D RADIATION PATTERN

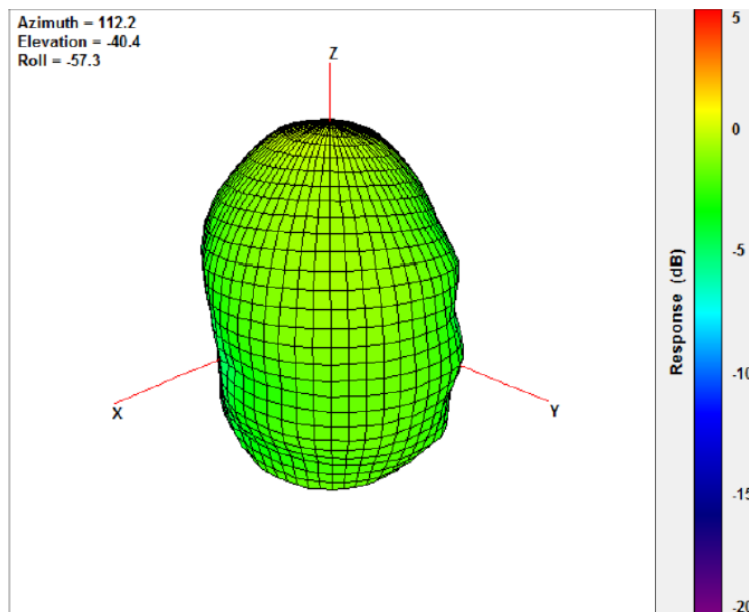
1561MHz



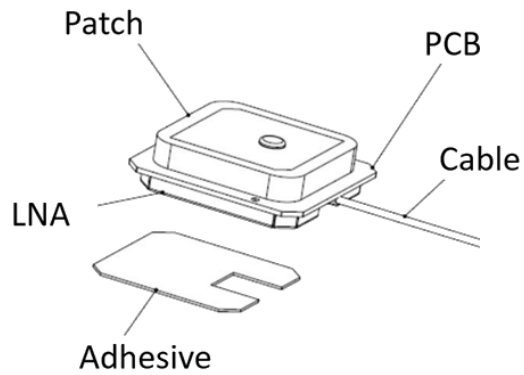
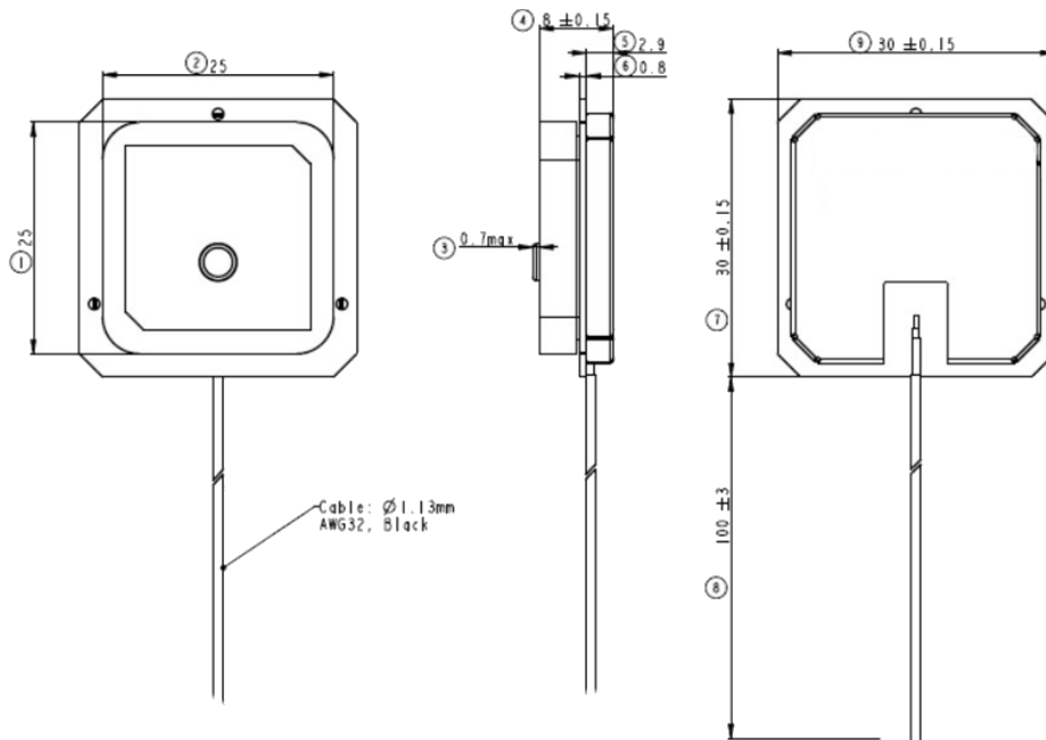
1575.42MHz



1602MHz



MECHANICAL DRAWINGS



P.S.:

Adhesive tape material: 3M R16, T=0.4mm

It's not assembled, but included in the sales package

TESTING

All antennas are provided with tests reports regarding:

- Thermal Bake out (10E-5 mbar @ 50C for 72 hours)
- Full vibration test for Falcon 9, Electron, Soyuz, Dnepr and Long March 2D
- QT and AT is performed on the unit to be shipped.

Test	QT	AT
Functional	✓	✓
Vibration	✗	✓
Thermal Cycling	✗	✓
Thermal Vacuum	✗	✓
Antenna network VSWR Test	✓	✓

CONFIGURATIONS AND PRICES

- GCA01 v2Compact GNSS Active Patch Antenna: **1,700€**

AVAILABILITY

Immediately.