



# GCA01 – COMPACT GNSS ACTIVE PATCH ANTENNA

## PRODUCT NAME

GCA01- COMPACT GNSS ACTIVE PATCH ANTENNA

## SUMMARY

The EXA GCA01 is a one-stage, 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 one-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
- Low profile, only 4.7mm thickness
- 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:  $1575.42 \pm 4\text{GHz}$
  - GLONASS:  $1602 \pm 5\text{MHz}$
  - BeiDou:  $1561.098 \pm 2.046\text{MHz}$ .
- Polarization RHCP
- Antenna Gain at Zenith
  - (Ceramic Patch only)
    - GPS/Galileo 1575.42MHz: -2.5 dBi typ. @zenith
    - GLONASS 1602MHz: -1.5 dBi typ. @zenith
    - BeiDou 1561MHz: -1 dBi typ. @zenith
- Total Antenna Gain at Zenith
  - (Antenna+SAW+LNA+Cable+Connector)
    - GPS/Galileo 1575.42MHz: 15.5 +/- 3dBi
    - GLONASS 1602MHz: 16.5 +/- 3dBi
    - BeiDou 1561MHz: 17 +/- 3dBi
- Impedance 50 ohms
- Output VSWR Max 2.0
- LNA Properties:
  - Frequency range: 1558~1610 MHz.
  - Out of Band Attenuation:
    - 0-1534MHz, 13dB Min.
    - 1634MHz-6000MHz, 20dB Min.
  - 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 1.8V 12dB 5mA 3.0dB
    - Typ 3.0V 18dB 10mA 2.8dB
    - Max 5.5V 22dB 23mA 3.0dB

## PRODUCT PROPERTIES

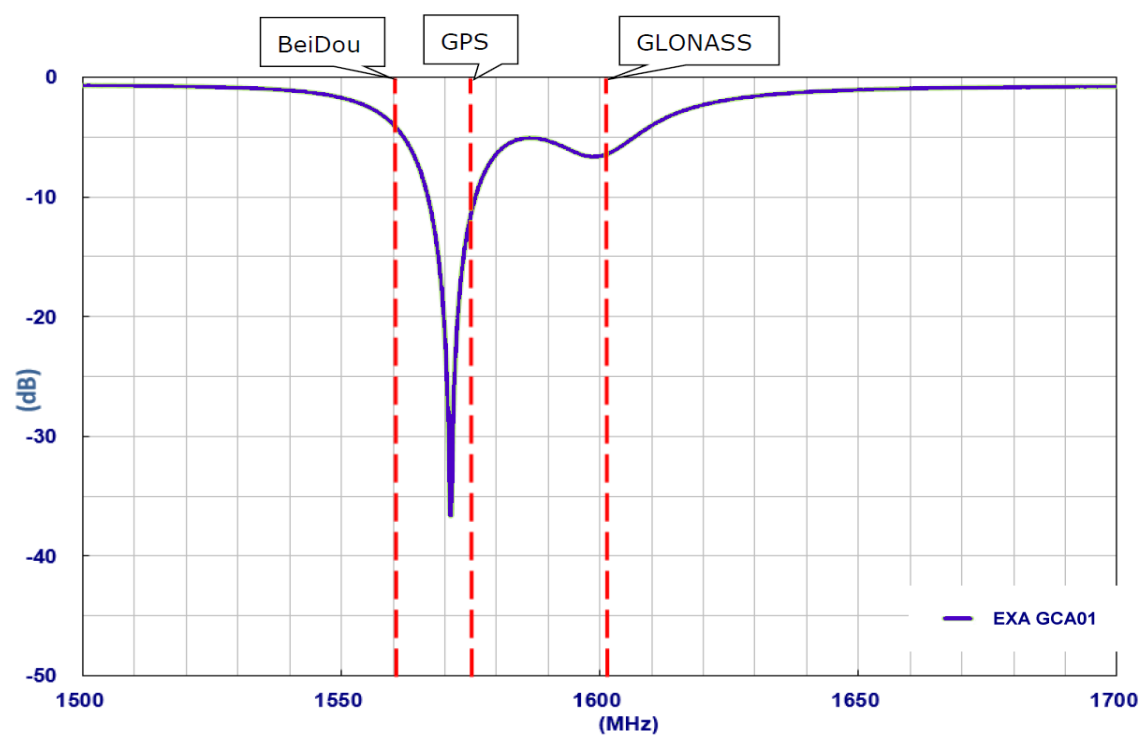
- Ceramic Dimension:
  - 25.1 x 25.1 x 4.7mm
- Total Dimension (including shielding case)
  - 25.1 x 25.1 x 7.9mm
- Connector IPEX MHFI (U.FL) / SMA / MCX
- Cable coaxial cable: Ø1.13, length 60mm
- Mass: 11.38 grams
- Operating Temperature: -40 to +85°C
- Radiation Tolerance: 4 years minimum in LEO

## MATERIALS

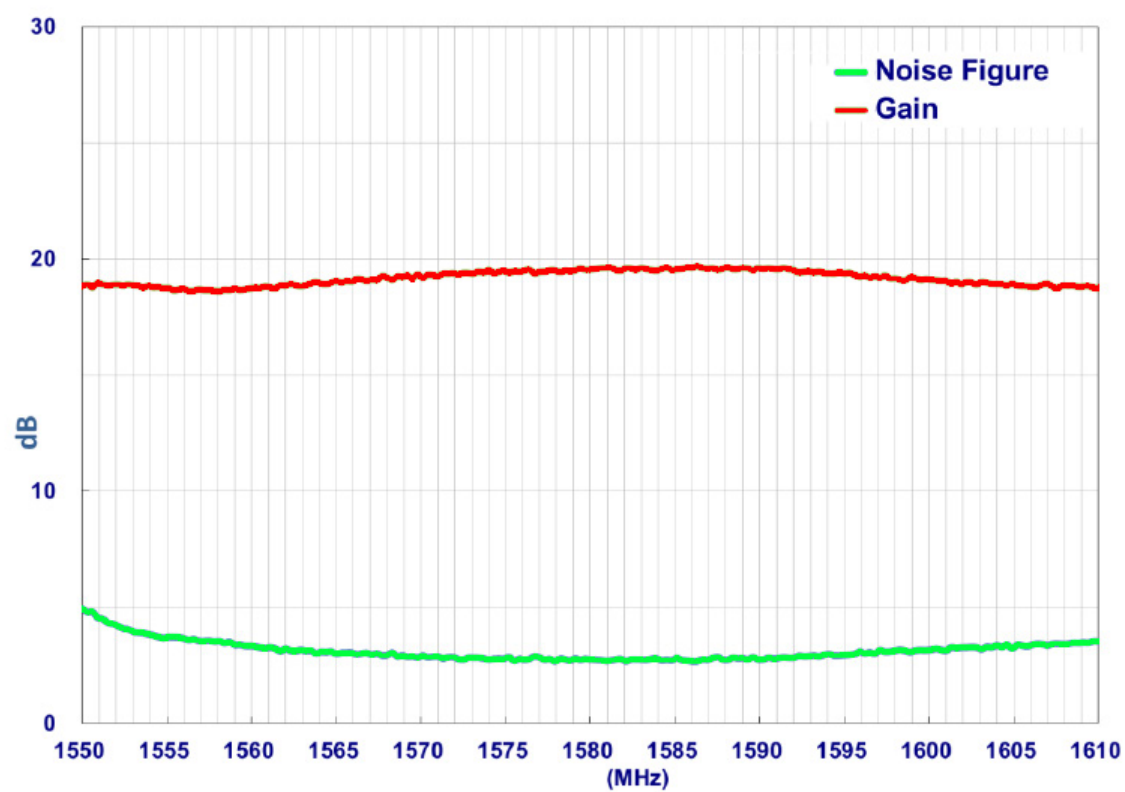
- Only TML and CVCN < 1% materials used, NASA and ESA approved
- Antenna Material: Ceramic
- Connector: SMA, MCX or U.F.
- PTFE (Teflon) space grade cables, coax, custom choice

## PRODUCT CHARTS:

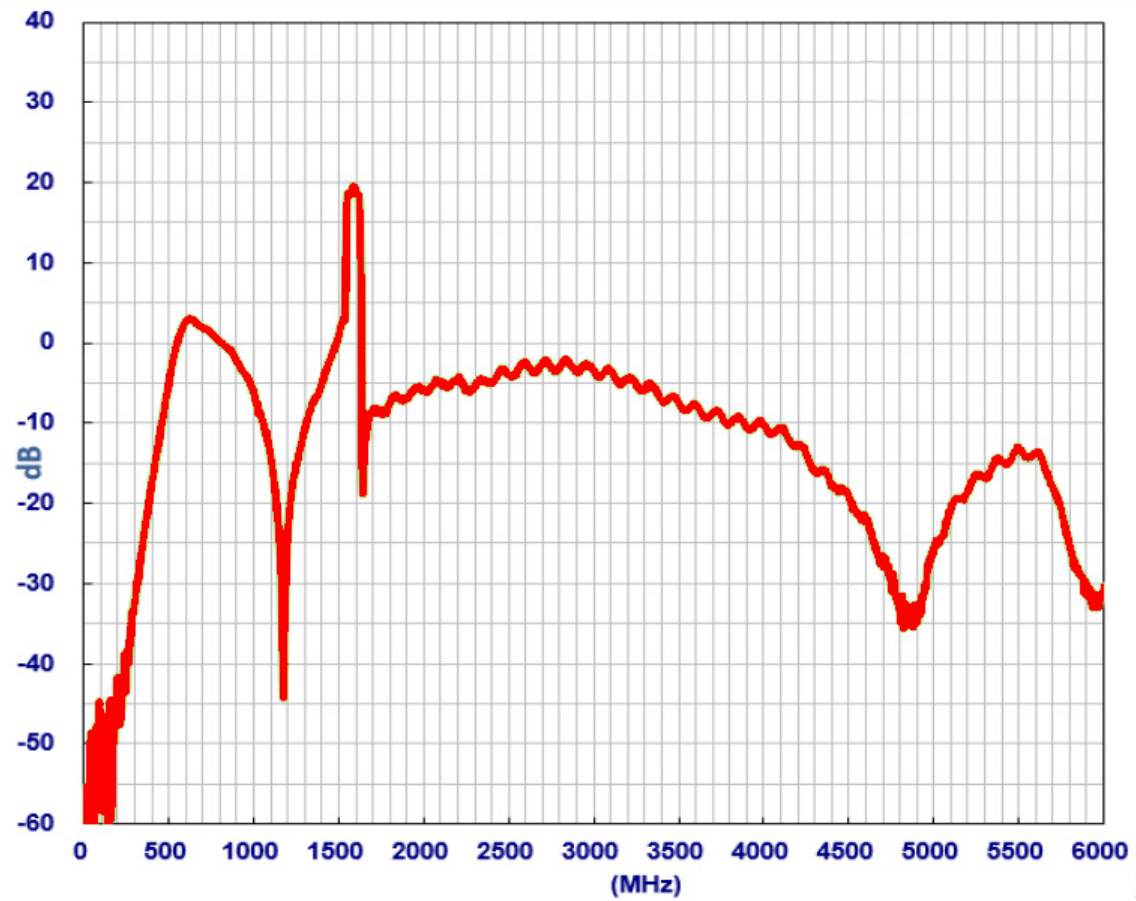
### ANTENNA RETURN LOSS



### NOISE FIGURE vs GAIN

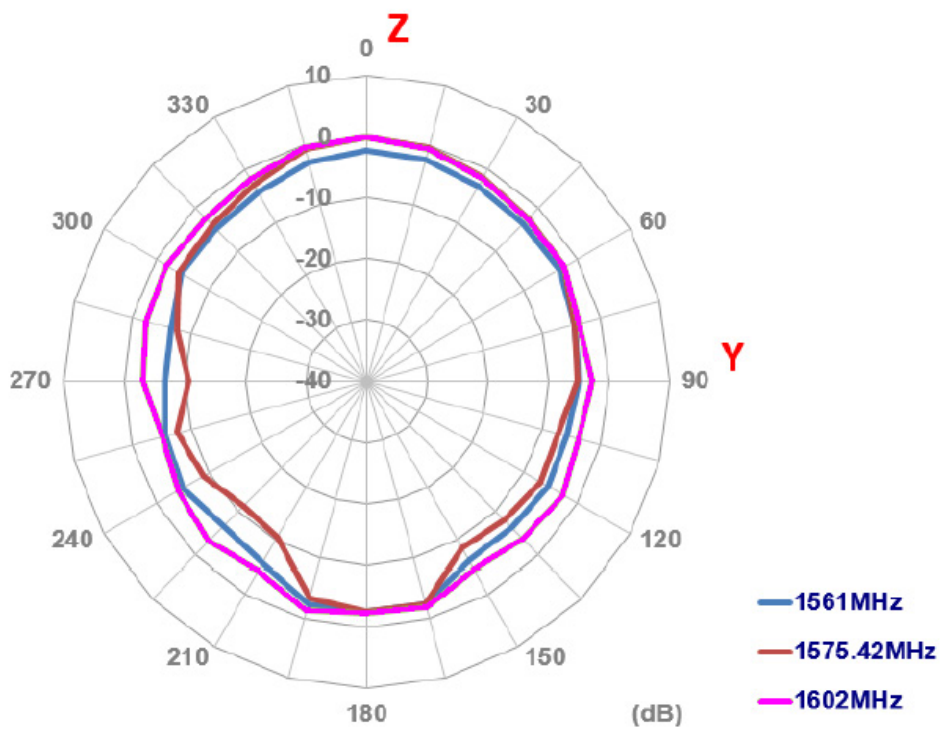


## LNA GAIN



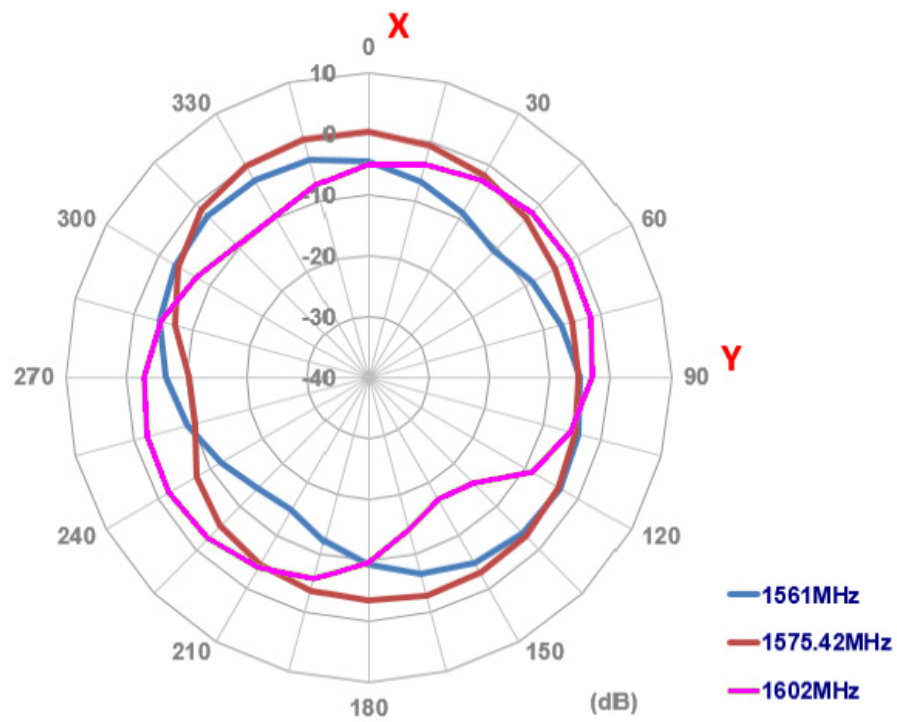
## 2D RADIATION PATTERN

### YZ Plane

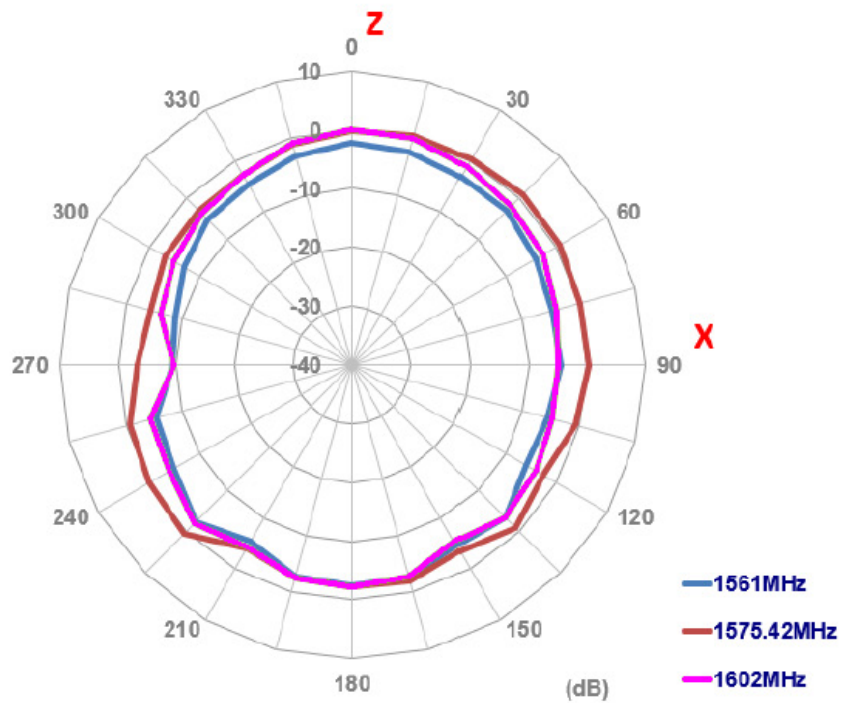


## 2D RADIATION PATTERN

### XY Plane

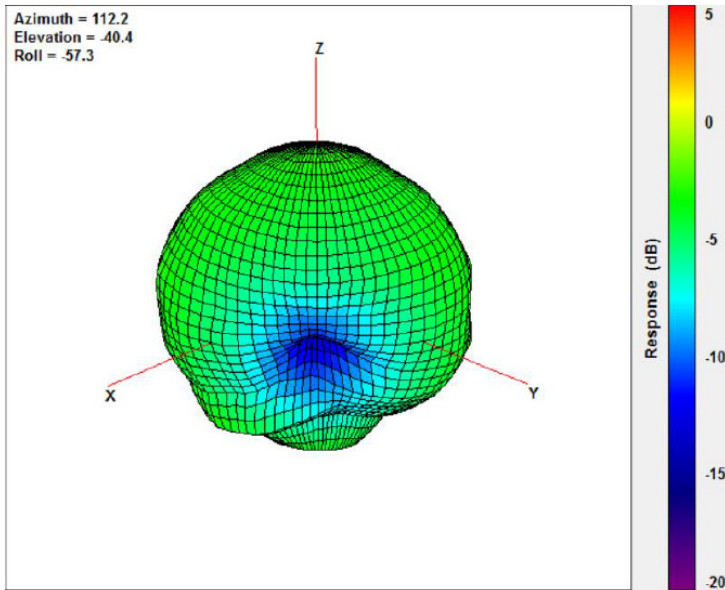


### XZ Plane

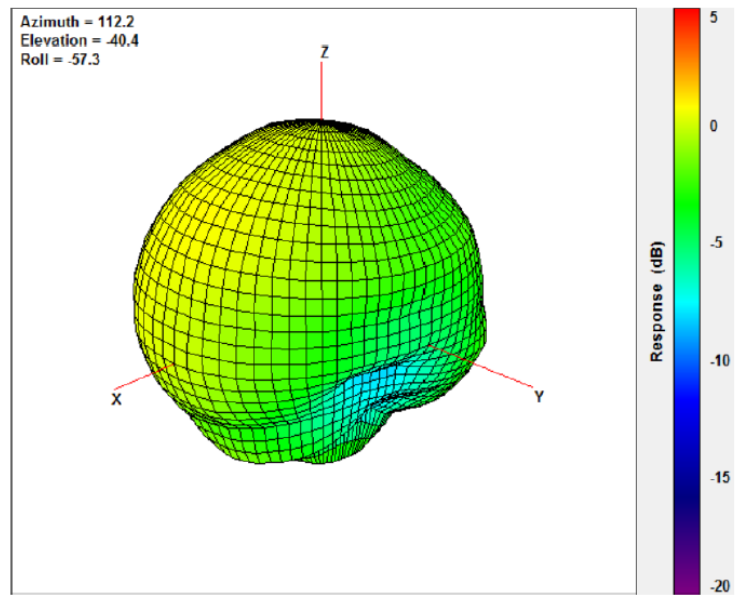


## 3D RADIATION PATTERN

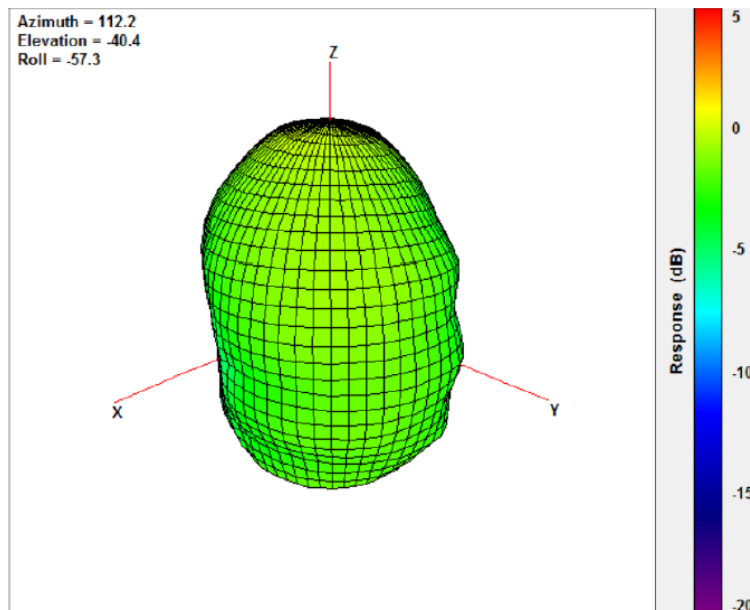
1561MHz



1575.42MHz



1602MHz



## 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	✓	✓



## CONFIGURATION and PRICES

- GCA01 Compact GNSS Active Patch Antenna: 1700€

## AVAILABILITY:

- Immediately

