TAOGLAS®

Datasheet
TGGL02 - GNSS L1/L5 Vortex Series

GNSS L1/L5 Vortex Series Antenna

The Taoglas L1/L5 Vortex Series Antenna is a dielectric loaded decafilar helix, which uses patented Dielectrix antenna technology to provide the highest available efficiency per unit of size/volume.

These antennas have excellent co-to-cross polarization and therefore provide useful discrimination of multi-path (reflected polarization-reversed) signals. They are balanced and isolated from platform ground, ensuring high immunity to common-mode noise and very low proximity de-tuning caused by nearby objects.

TGGL02 Vortex Series Dielectrix Antennas deliver predictable installed performance that belies the small size, due to operation of the dielectric-core material (patent-protected).

The product is available encapsulated with a protective radome, or unencapsulated as appropriate for direct integration into devices.

Powered By: helix GEOSPACE

Key Features

Tuned to GNSS L1 and L5 frequencies: (L1) 1,560.075 - 1,590.765 MHz and (L5) 1,164 - 1,191.75 MHz

- Intrinsic band-pass filter response, tightly tuned to L1 and L5 frequency bands – provides protection from out of band interference
- High multi-frequency gain for an antenna of this size (dc short - circuit)
- Immune to static discharge and lightening splashes
- RHCP with excellent co-to-cross polarization ratio even in the absence of a ground plane. Effective rejection of multipath (polarization-reversed) signals
- Cardioid radiation pattern - optimal reception of signals from low elevation satellites, and when antenna is in a dynamic application (e.g. maritime, airborne and vehicle applications)
- Robust – withstands shock and vibration
- Wide operating temperature range (-40 to +85 deg C)
- SMA or U.FL connector option available
- Multi-constellation, covers BeiDou B1/B2a, Galileo E1/E5a, GLONASS G1, and SBAS.

Key Dielectrix Features

- Focused phase centering that is highly accurate and reproducible – a key requirement for autonomous positioning
- Low de-tuning due to objects in the near-field – Ideal for hand-held and vehicle-mounted applications
- Balanced antenna – resilient to common-mode noise (e.g. vehicle chassis ground fluctuations due to in-car compute and electric drive-train noise)

Applications

Taoglas TGGL02 Vortex Series antennas are ideally suited for PNT (Position, Navigation and Timing) applications in which resilience, position accuracy and compact form factor are essential.

- Precision location and navigation
- Precision timing for network sync and crypto
- Defense/security/CNI/first responder
- UAS/UAV autonomous vehicles and drones
- Asset tracking and fleet vehicle tracking
- Internet of Things
- Personal safety devices, geofencing
- Hand-held and wearable location devices
- Industrial/oil & gas/mining
- AgTech, precision farming, animal tracking.

dielectrix

Antenna technology provides unrivalled efficiency per unit volume.

Taoglas provides custom tuning services to optimise and tune antenna performance when integrated into customers enclosure.

Electrical Specifications

	Min	Typical	Max	Units
Frequency L1	1560.075		1590.765	MHz
Frequency L5	1,164		1,191.75	MHz
Bandwidth (3db) L1	30.69			MHz
Bandwidth (3db) L5	27.75			MHz
Axial ratio			3	dB
Phase centre variation between parts			10	mm
VSWR (Voltage Standing Wave Ratio)			2:1	
Multipath Reduction Ratio (MRP)		10		dB
Impedance		50		Ohms
Operating temp range	-40		+85	C
RF connector		SMA (male pin)		
Noise figure		1.5		dB
Power supply	1.8	3.3	5	V
Current draw		9		mA

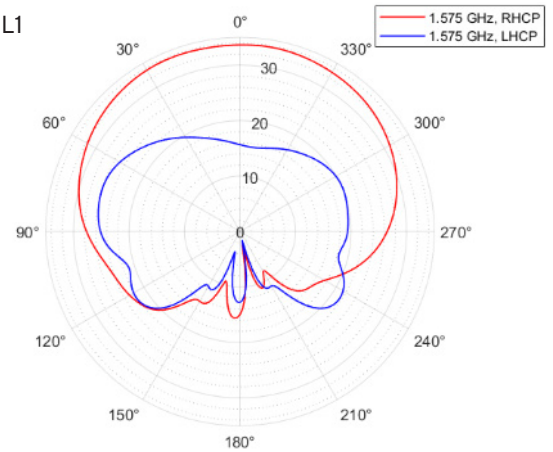
Filtered Specifications

	Min	Typical	Max	Units
Polarisation: co-to-cross disc	15			dB
Antenna element peak gain L1		33		@zenith dBic
Antenna element peak gain L5		30		@zenith dBic
Out of band rejection			40	dB

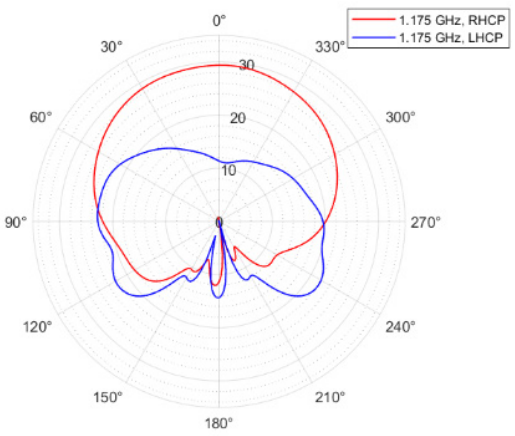
Radiation Patterns

The following radiation patterns have been measured WITHOUT a ground plane.

L1



L5



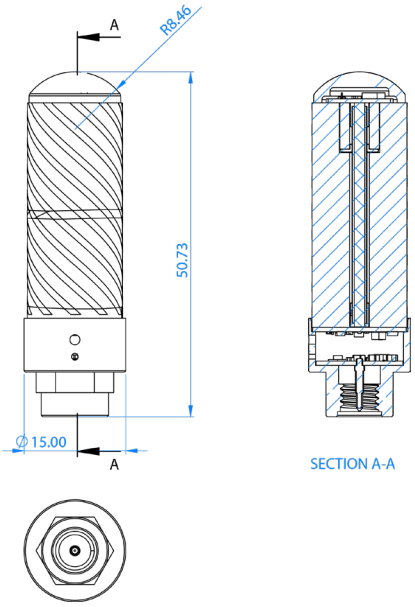
	Phase Center Offset L1/L5			Phase Center Variation L1/L5		
	Min	Mean	Max	Min	Mean	Max
TGGL02052-SA01, x	0.3/0.7	0.3/0.8	0.6/0.8	0.8/1.0	0.9/1.0	1.0/1.2
TGGL02052-SA01, y	-1.0/-1.5	-1.0/-1.3	-0.9/-0.9	-	-	-
TGGL02552-SA01, x	0.3/0.7	0.3/0.8	0.6/0.8	0.8/1.0	0.9/1.0	1.0/1.2
TGGL02552-SA01, y	-1.0/-1.5	-1.0/-1.3	-0.9/-0.9	-	-	-

Filtered Antennas

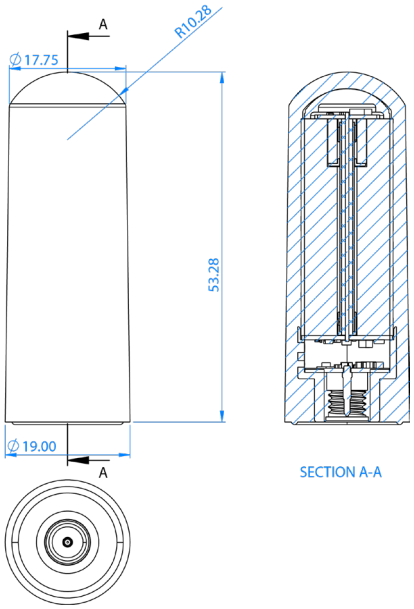
Part number	Antenna	Connector	Dimensions mm	Weight g
TGGL02052-SA01 	Active Filtered Embedded	SMA Male	L 50.77 x ø 15	32
TGGL02552-SA01 	Active, Filtered, Encapsulated plastic flat bottom radome Rated: IP67	SMA Male	L 53.28 x ø 19	38

Military Specification - available on request

TGGL02052-SA01 dimensions



TGGL02552-SA01 dimensions



Application Notes for Embedded Antennas

Taoglas off-the-shelf embedded antennas are optimised for free space testing, allowing designers to evaluate antenna fitment and performance in initial free space environments before finalizing the design.
Antennas may experience detuning when placed within any tightly packed enclosure. The proximity of the enclosure to the antenna affects the degree of detuning, which should be thoroughly tested to ensure acceptable performance for the intended application.

Customer-Specific Part

To address detuning and create a Customer-Specific Part, follow one of these approaches:

- **Provide a .STEP file of the enclosure with material properties included:** Our engineers will perform a simulation, evaluate retune and manufacture a new antenna part.
- **Send your physical enclosure:** Our engineers will perform the far-field anechoic chamber measurements, evaluate, retune and manufacture a new antenna part.

For antenna tuning services, please contact Taoglas to discuss your specific requirements.