

Iridium STL Antenna for Reliable Global PNT

The Taoglas Iridium STL active Vortex Series antenna is a compact, dielectric-loaded decafililar helix antenna designed for the Iridium band. Utilising proprietary Dielectrix antenna technology, it achieves exceptional efficiency relative to its size and volume.

The Iridium STL® - PNT Vortex Series antennas are active, receive-only Iridium antennas that support terminal installations several meters away from the antenna. They feature a low-current, low-noise amplifier (LNA) to ensure reliable signal amplification. Excellent co-to-cross polarization enhances multi-path signal rejection, while balanced isolation resists common-mode noise and maintains performance near objects.

Compact and powered by patented dielectric core technology, the antenna is available encapsulated with a protective radome or unencapsulated for integration.

This datasheet outlines the mechanical properties of the unencapsulated version.



Key Features

Tuned to Iridium STL frequency: 1,626 MHz

- Operates indoor – maintains synchronous timing without the need for an outdoor mounted antenna
- RHCP polarization with up to above 30dB co-to-cross polarization discrimination - exceptional rejection of multi-path (reflected) signals
- Cardioid radiation pattern - optimised for reliable reception of signals from low-elevation satellites, even in dynamic environments, ensuring robust PNT performance for critical infrastructure applications
- Encapsulated variants provide IP67 environmental protection ideal for external mount in challenging environments
- Robust – withstands shock and vibration
- SMA or U.FL connector option- SMA defined in this datasheet.

Key Dielectrix Features

- Protection against lightening splashes or static discharge
- Negligible detuning due to objects in close proximity – ideal for PNT applications
- Balanced antenna – designed to resist common-mode noise, which can arise from sources such as fluctuating ground potentials in electrical substations, electromagnetic interference from high-power equipment, or noise generated by dense computing systems in data centers

Applications

Taoglas Iridium STL - PNT Vortex Series antennas are purpose-built for diverse applications requiring reliable PNT solutions as an alternative to GPS/GNSS connectivity. Their robust performance ensures accuracy and resilience, making them indispensable for critical systems and infrastructure:

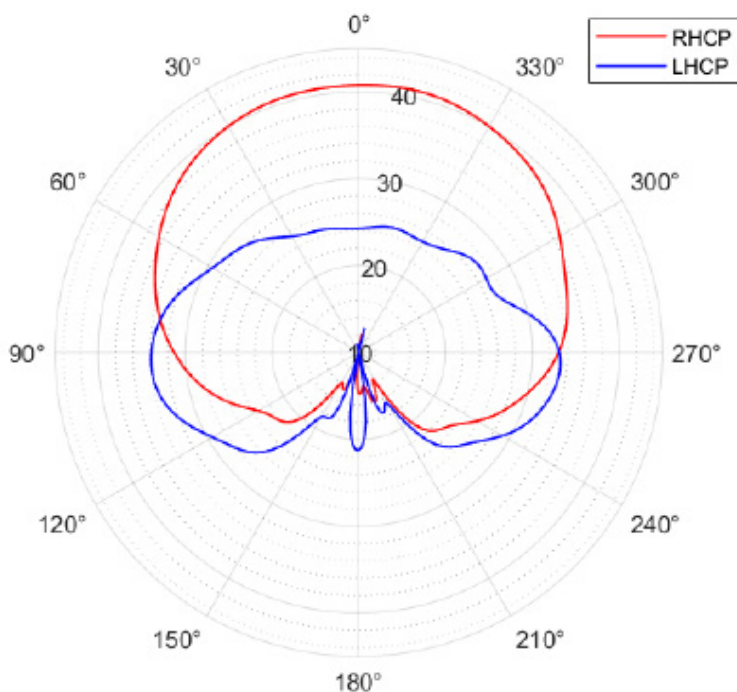
- Telecommunications – Supports the precise timing demands of 5G networks
- Maritime – Provides a secure PNT solution to mitigate the risks posed by GPS spoofing and cyberattacks
- Data Centers – Ensures accurate timing essential for wide-area networking, facilitating efficient communication and synchronization between distributed network nodes to maintain operational integrity.
- Power Grids – Delivers precise time synchronization for interconnected grid operations, enhancing coordination and stability across energy distribution systems
- Transportation – Offers reliable PNT data for applications such as location tracking, speed monitoring, and collision or derailment prevention in sectors like rail, aviation, and autonomous vehicles
- Cybersecurity – Provides a resilient and secure PNT layer, supports strengthening against spoofing and jamming attacks in critical infrastructure and sensitive systems.



Electrical Specifications

	Min	Typical	Max	Units
Frequency		1626		MHz
Antenna element peak gain		42		dBic
Efficiency		60		%
Bandwidth (3db)	11			MHz
Axial Ratio			3	dB
Co-to-cross pole discrim @ zenith	15			dBic
VSWR (Voltage Standing Wave Ratio)			2:1	
Impedance		50		Ohms
Operating temp range	-40		+85	C
Phase Center Offset, x	-0.3	-0.2	-0.2	cm
Phase Center Offset, y	0	0	0.1	cm
Phase Center Variation	0.2	0.2	0.3	mm
Group Delay	11.2	19.4	23.6	ns

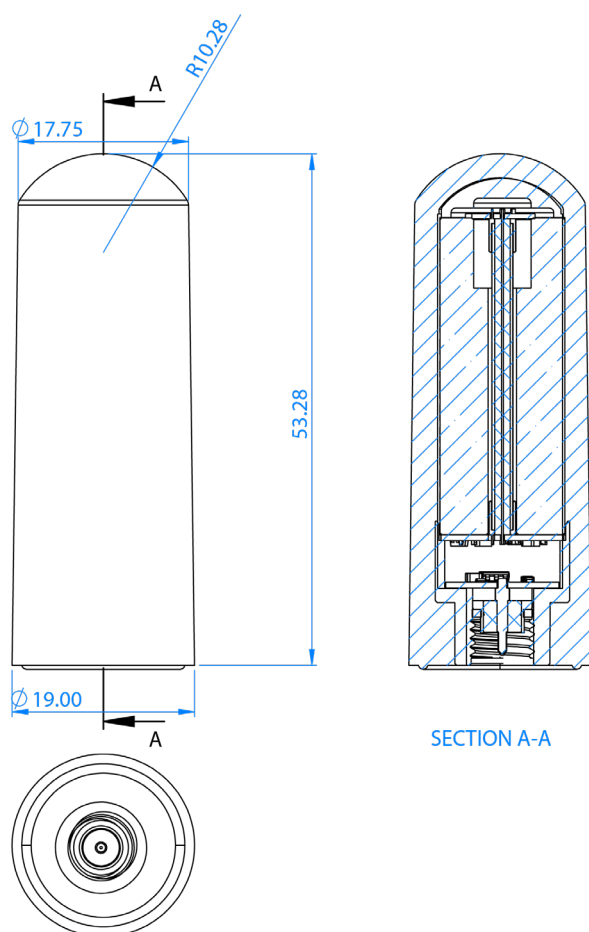
Radiation Patterns

Realised Gain Plot (measured at centre frequency)

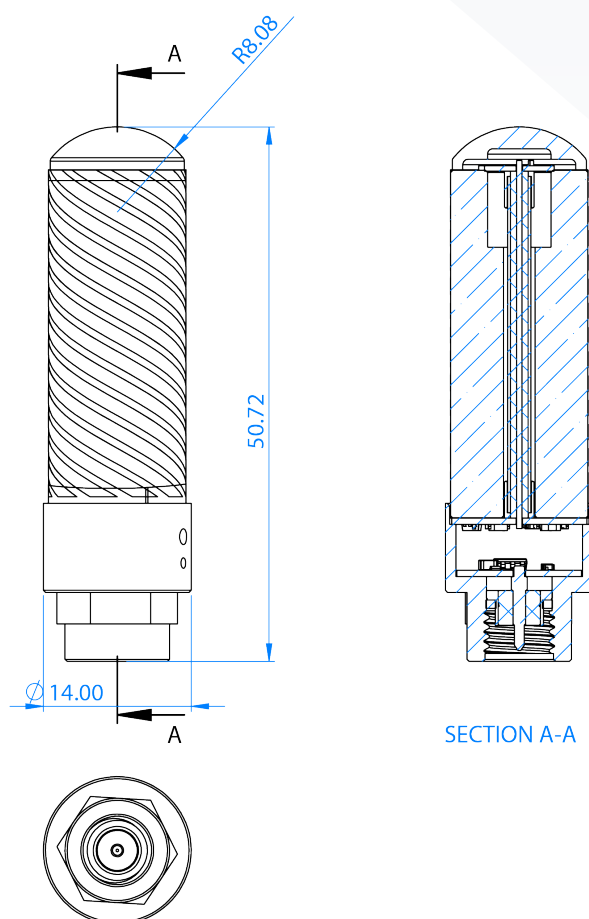


Part number		Antenna	Connector	Dimensions mm	Weight g
TGDC26562-SA00		Active Encapsulated with skirt, plastic radome Rated: IP67	SMA Male	L 53.28 x \varnothing 20	31
TGDC26062-SA00		Active Embedded	SMA Male	L 50.72 x \varnothing 14	24

TGDC26562-SA00



TGDC26062-SA00



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.

Application Notes for Embedded Antennas

Taoglas off-the-shelf embedded antennas are optimized 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.

Measuring the S-parameters is recommended to check if the enclosure shifts the antenna away from the center frequency.

Customer-Specific Part

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

- **Measure the S-parameter performance:** Conduct S-parameter measurements within your enclosure and consult with Taoglas engineers. We will customize the antenna pattern based on your data.
- **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.

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