Datasheet

IoT Certus 9704 Vortex Series

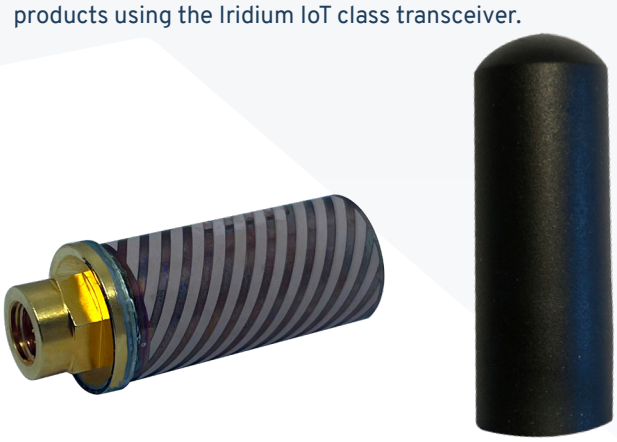
Iridium IoT 9704 Antenna

The Taoglas Iridium IoT 9704 antenna is a dielectric loaded decafilar helix, Iridium band antenna 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 resilience to common-mode noise and very low proximity de-tuning caused by nearby objects.

Dielectrix antennas deliver predictable installed performance despite having small size, due to operation of the dielectric-core material (patent-protected). The antenna is available with a protective radome or in embedded formats — bare antennas that customers can design their own radomes for or integrate directly into their products.

Iridium IoT 9704 antennas are compliant with the Iridium technical specification IR5187-TRD-005 Issue 3 and complies with the radiation pattern mask when it is mounted in vertical orientation. It is ideally suited for integration with customer products using the Iridium IoT class transceiver.



Powered By: helix GEOSPACE

iridium® connected

Key Features

Tuned to Iridium frequency: 1,616 - 1,626.5 MHz

- Intrinsic band-pass filter response, tightly tuned to Iridium frequency band – immune to out of band interference
- Protection against lightening splashes or static discharge
- RHCP with excellent co-to-cross polarization ratio even in the absence of a ground plane.
- 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)
- IP67 environmental protection for external mount in harsh environments (available on request)
- Robust – withstands shock and vibration
- SMA or U.FL connector option available - SMA defined in this datasheet.

Applications

Taoglas Iridium IoT 9704 antennas are ideally suited for various IoT products that require reliable and global connectivity, particularly in remote or challenging environments where traditional cellular or terrestrial networks may not be available.

- Defense/security devices
- Maritime and fishing applications
- Asset tracking and fleet vehicle tracking
- Environmental monitoring sensors
- Agricultural monitoring devices
- Energy sector applications / offshore and remote sensing
- Remote industrial monitoring.

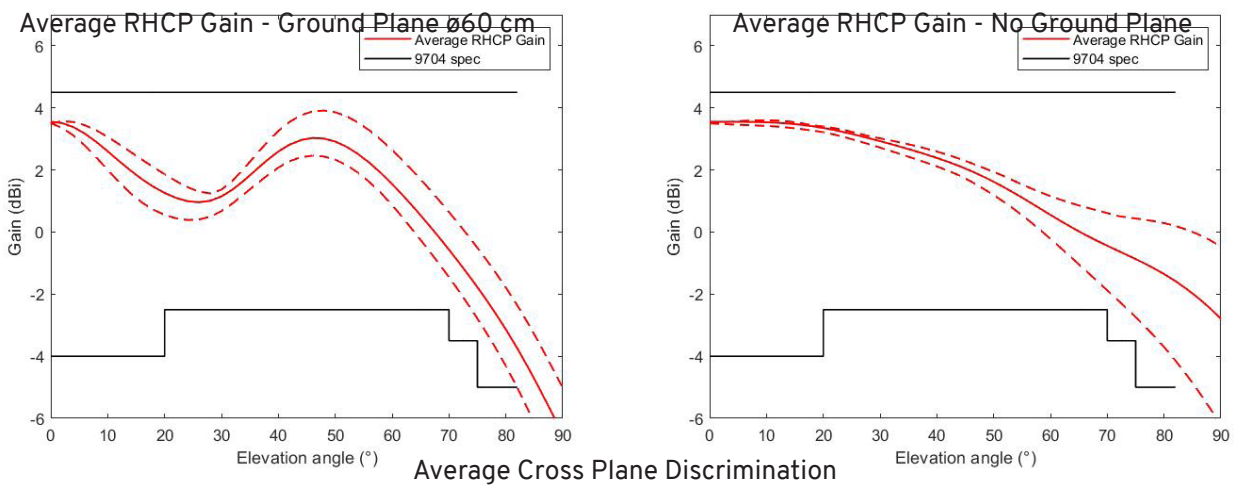
Key Dielectrix Features

- Smallest Iridium antenna - L 42mm x ø 16mm
- Negligible de-tuning due to objects in the near-field – ideal for hand-held and vehicle-mounted applications
- Balanced antenna – provides immune to common-mode noise (e.g. vehicle chassis ground fluctuations due to in-car compute and electric drive-train noise)
- Its small size and higher immunity to detuning form nearby objects enables a much easier embedding in a device whilst helps to pass the SAR regulations

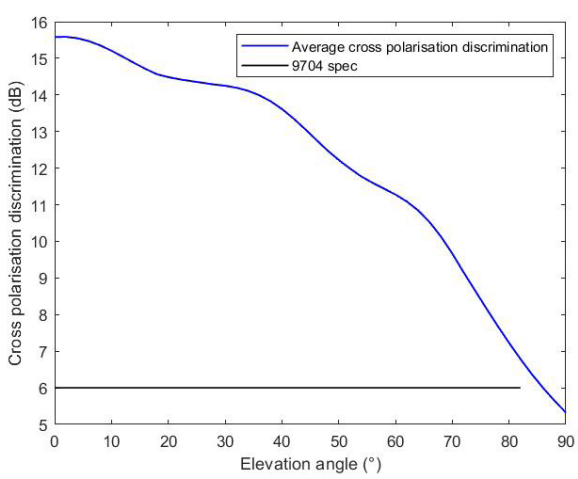
Electrical Specifications

	Min	Typical	Max	Units
Frequency	1616	1621 (mid-band)	1,626.5	MHz
Peak Gain (RHCP)	2			dBic
Efficiency	65			%
Bandwidth (3dB)	20			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 Variation	0.2	0.2	0.3	cm
Phase Center Offset, x	0.6	0.7	0.8	cm
Phase Center Offset, y	-0.4	-0.4	-0.3	cm

Gain and Cross-Polarisation Performance

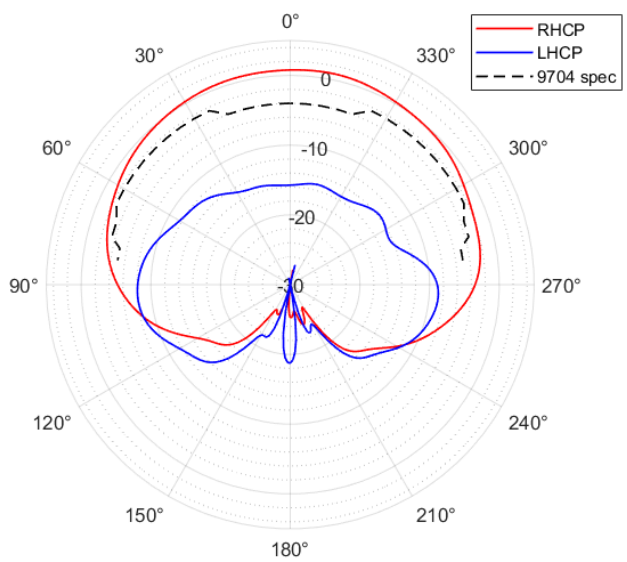


Average Cross Plane Discrimination



Radiation Patterns

The following radiation pattern has been measured WITHOUT a ground plane.



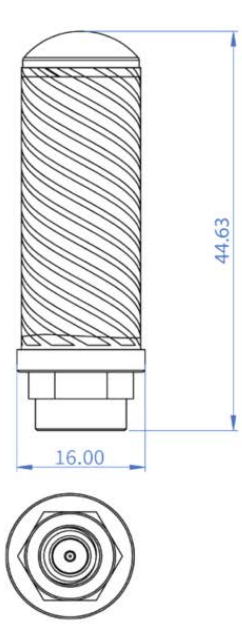
dielectrix

Antenna technology provides unrivalled efficiency per unit volume.

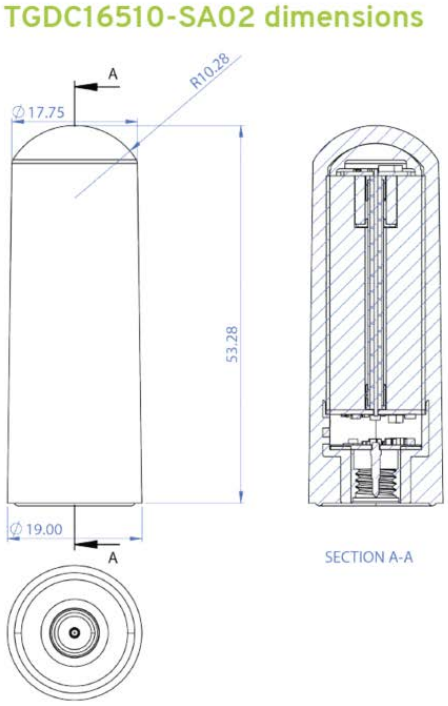
Taoglas provides custom tuning services to optimise and tune antenna performance when integrated into customers enclosure.

Part number	Antenna	Connector	Dimensions mm	Weight g
TGDC16010-SA02 	Passive Embedded	SMA Male	*L 44.6 x ø16*	*26.1*
TGDC16510-SA02 	Passive Encapsulated plastic flat bottom radome Rated: IP67	SMA Male	*L 53.28 x ø19*	*32.2*

TGDC16010-SA02 dimensions



TGDC16510-SA02 dimensions



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.

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.