

# GeoHelix<sup>®</sup>-S

## Active GPS Antenna

### Product Specification



#### Product Description

Built on patented PowerHelix<sup>®</sup> filtering antenna technology, the GeoHelix-S surface-mount high-gain GPS antenna is the smallest active quadrifilar helix antenna available, providing high performance in difficult GPS applications. The GeoHelix-S integrates a high-performance, high-gain, low-noise amplifier with Sarantel's GeoHelix antenna for receivers requiring an active input. The GeoHelix-S antenna is ideal in applications where:

- the device is handheld, body-worn, or otherwise surrounded by high-dielectric materials that would de-tune conventional antennas;
- the antenna is tightly integrated with other antennas, e.g., Bluetooth<sup>®</sup>/GPS receivers or GPS/GSM mobile phones;
- there are tight constraints on the size of the device or the amount of space allocated to ground planes;
- the GPS receiver requires 20dB or more of input pre-amplification;
- the orientation of the device is random; or
- the antenna will be embedded in the device.

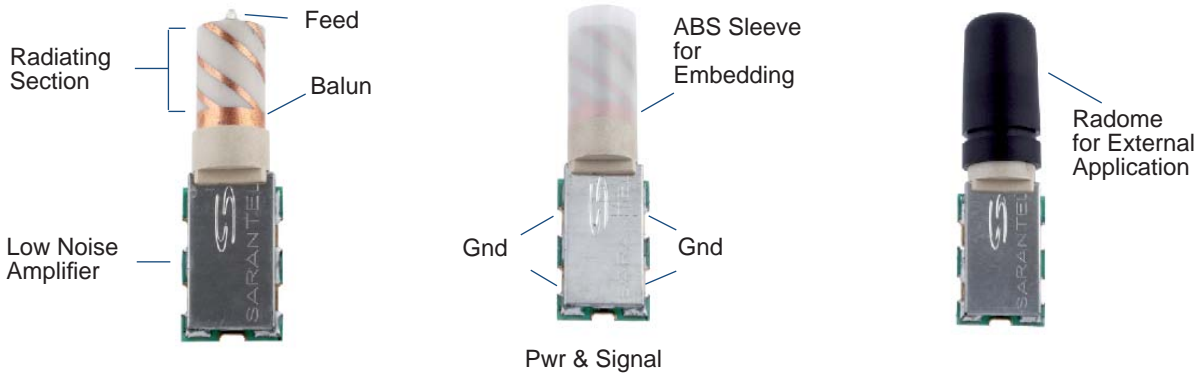


The GeoHelix-S antenna is balanced, which isolates it from the device and enables the antenna to reject common mode noise resident on the device ground plane. The construction and materials of the antenna constrain its near-field to a very small volume, therefore materials near the antenna have negligible de-tuning effects and the antenna maintains its pattern and efficiency in the presence of dielectric loading. As a dielectrically-loaded antenna with a high-performance SAW filter, the GeoHelix-S antenna effectively attenuates signals from common GSM and ISM frequencies by as much as 55dB, minimizing the need for additional filtering.

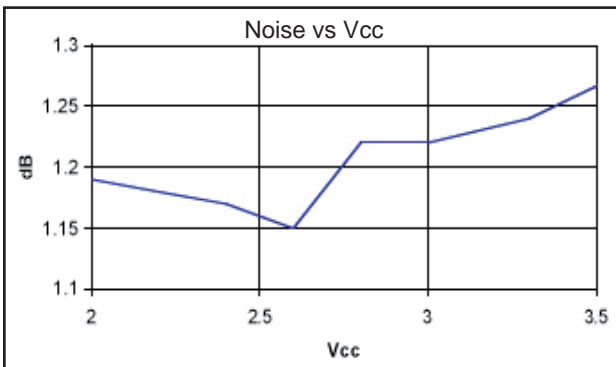
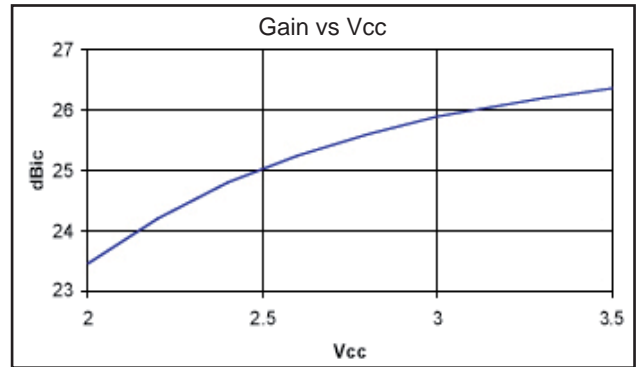
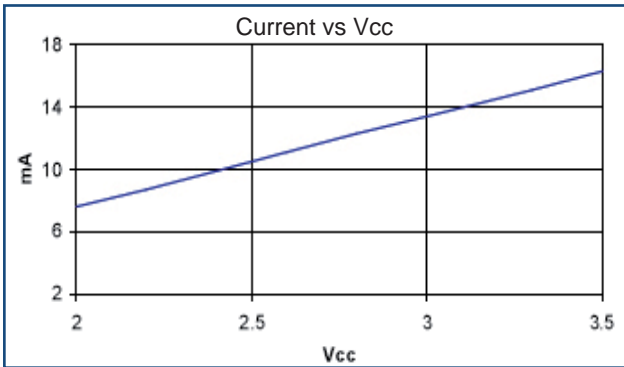
The GeoHelix-S antenna may be deployed in an external, "stub-style" configuration, but it is also a simple antenna to embed due to its isolation properties. The antenna is deployed with either a black radome or an ABS plastic sleeve, depending on customer device configuration.

#### Specifications

	Minimum	Typical	Maximum	Unit
Part Number	1010021 with cap 1010043 with sleeve			Each
Type	Quadrifilar Helix			
Frequency	1573.42	1575.42	1577.42	MHz
Polarization	Right-hand circular polarized			
Voltage	2	3.3	3.5	V
Current		15	17	mA
Gain	+22	+24		dBic
Beamwidth		>120		Degrees
Bandwidth (3dB)		20		MHz
Axial Ratio		<2.0		@Zenith
VSWR		<2.0:1	2.3:1	
Impedance		50		
Noise Figure		1.2	1.3	dB
Input 3rd Order Intercept Point		0		dBm
Operating Temperature	-40	+20	+85	°C
Element Dimensions	10 (diameter) x 17 (length)			mm
Overall Dimensions (w/radome)	13 (dia) x 15 (width) x 49 (length)			mm
Weight (excl radome or sleeve)	10			grams
Mounting	SMT			



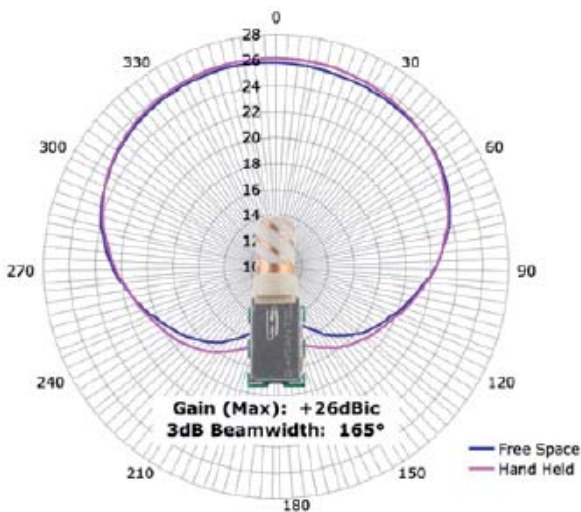
## Low Noise Amplifier Characteristics



The GeoHelix-S high-gain, low-noise amplifier, optimized for 3Vdc, provides greater than 24dB peak gain with less than 1.25dB insertion loss at a current draw of less than 14mA.

This antenna is ideal for receivers with an input gain spec of 20 to 30dB

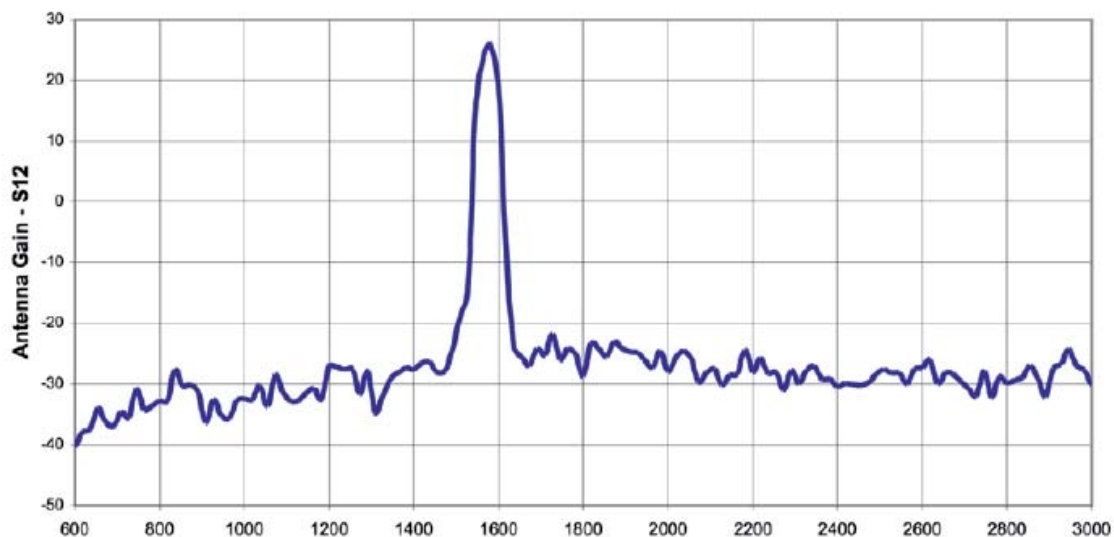
## Radiation Pattern (dBic)



The strength of the PowerHelix antenna technology is its immunity to de-tuning in the presence of dielectric loading, like human tissues. The GeoHelix-S antenna retains efficiency and polarization near the human body. Conventional antennas lose 5-10dB of gain in similar circumstances.

Though it will not electrically couple with a ground plane, the GeoHelix-S antenna can be expected to increase efficiency by up to 100% when mounted over a ground plane due to near-field signal reflections. Configuration and orientation of the ground plane with respect to the antenna will vary results, but efficiency will not decrease.

## Filtering Response



Frequency (MHz)		S <sub>12</sub> (dB)
860	GSM 900	-30
970		-35
1575.42	GPS (L1)	+25
1700	GSM 1800	-25
1800		-28
1900		-24
2450	Bluetooth/Wifi	-30

## Embedding information



GeoHelix antennas may be mounted externally or embedded within a device. External applications will give the antenna the greatest field of view, however embedded applications can be designed with minimal impact on antenna performance. When mounting externally, the groove in the radome should be used as a mechanical support. When mounting internally, the ABS sleeve must be used to ensure on-frequency performance. For further information on embedding the GeoHelix antenna, see the embedding guideline documents.

Mechanical Drawings - Overall Dimensions

