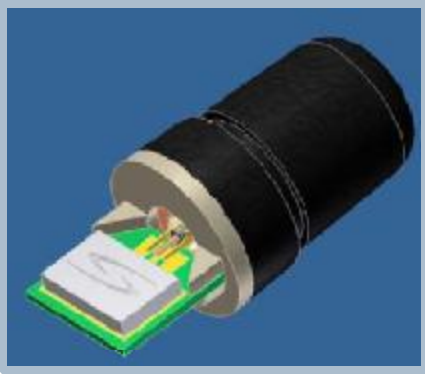
# GeoHelix-M

## 2nd Generation Active GPS Antenna

## Preliminary Product Specification



### Product Description

Built on patented PowerHelix® filtering antenna technology, the GeoHelix-M surface-mount GPS antenna is the smallest active quadrifilar helix antenna available, providing high performance in difficult GPS applications. The GeoHelix-M integrates a high-performance, optimised gain, low-noise amplifier with Sarantel's GeoHelix antenna for receivers requiring an active input. The GeoHelix-M has been optimally designed to work best with the latest generation of GPS chipsets. The GeoHelix-M 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®/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 2nd Generation GPS receiver requires optimised LNA gain for optimal GPS performance;
- the orientation of the device is random; or
- the antenna will be embedded in the device.

The GeoHelix-M 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, the GeoHelix-M antenna effectively attenuates signals from common GSM and ISM frequencies, minimizing the need for additional filtering.

The GeoHelix-M antenna may be deployed in an external, "stub-style" configuration, but it is also a simple antenna to embed due to its isolation properties.

### Specifications

| | Minimum | Typical | Maximum | Unit |
|---|---|---|---|---|
| **Part Number** | | SL1204 | | Each |
| **Type** | | Quadrifilar Helix | | |
| **Frequency** | 1573.42 | 1575.42 | 1577.42 | MHz |
| **Polarization** | | Right-hand circular polarized | | |
| **Voltage** | | 2.7 | 3.5 | V |
| **Current** | | 6 | | mA |
| **Gain** | | +18 | | dBic |
| **Beamwidth** | | >120 | | Degrees |
| **Bandwidth (3dB)** | | 20 | | MHz |
| **Axial Ratio** | | <2.0 | | @Zenith |
| **VSWR** | | <2.0:1 | 2.3:1 | |
| **Impedance** | | 50 | | |
| **Noise Figure** | | 1.6 | | dB |
| **Input 3rd Order Intercept Point** | | -9 | | dBm |
| **Operating Temperature** | -40 | +20 | +85 | °C |
| **Element Dimensions** | | 10 (diameter) x 17 (length) | | mm |
| **Overall Dimensions (w/radome)** | | 13 (dia) x 14.4 (width) x 32 (length) | | mm |
| **Weight (excl radome or sleeve)** | | | | grams |

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Specifications subject to change

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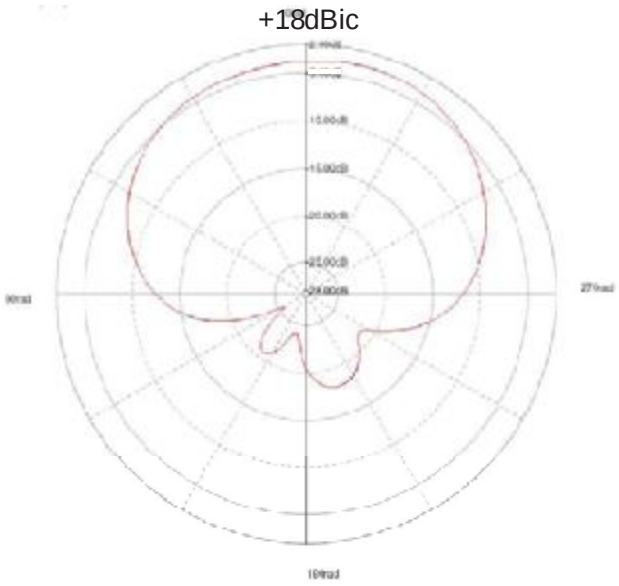
## **Radiation Pattern** (dBic)




The GeoHelix-M, with optimised LNA gain and low-noise figure, provides a typical gain and Noise Figure of 18dBic and 1.6dB, respectively.
This antenna is designed to work efficiently with the latest generation of GPS chipsets out in the market today.

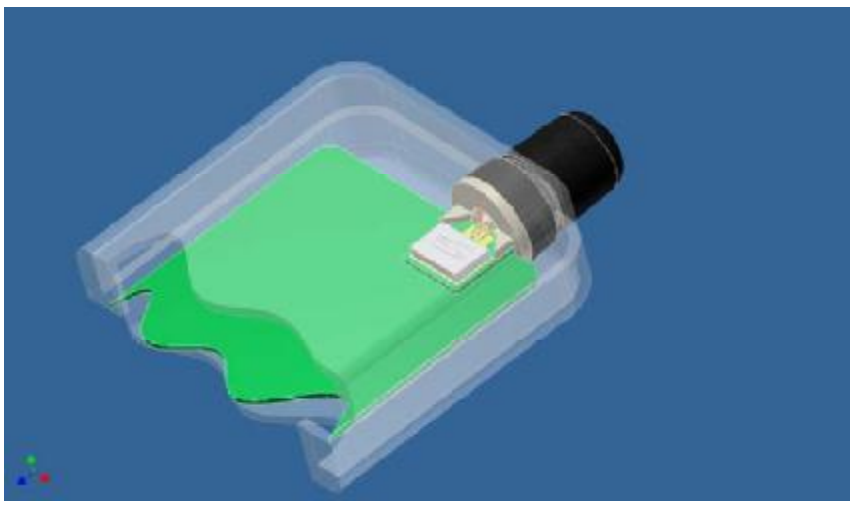
The strength of the PowerHelix antenna technology is its immunity to de-tuning in the presence of dielectric loading, like human tissues. The GeoHelix-M antenna retains efficiency and polarization near the human body. Conventional antennas lose 5-10dB of gain in similar circumstances.

Though it will not electrically couple with a ground plane, the GeoHelix-M 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) | | $S_{12}$ (dB) |
|---|---|---|
| 860 | GSM 900 | -30 |
| 970 | | -35 |
| 1575.42 | GPS (L1) | +18 |
| 1700 | GSM 1800 | -25 |
| 1800 | | -28 |
| 1900 | | -24 |
| 2450 | Bluetooth/Wifi | -30 |

## External Mounting



GeoHelix-M antennas may be mounted externally or embedded within a device. When mounting externally, the groove in the radome should be used as a mechanical support. For further information on integrating the GeoHelix-M, please refer to the integration guideline.

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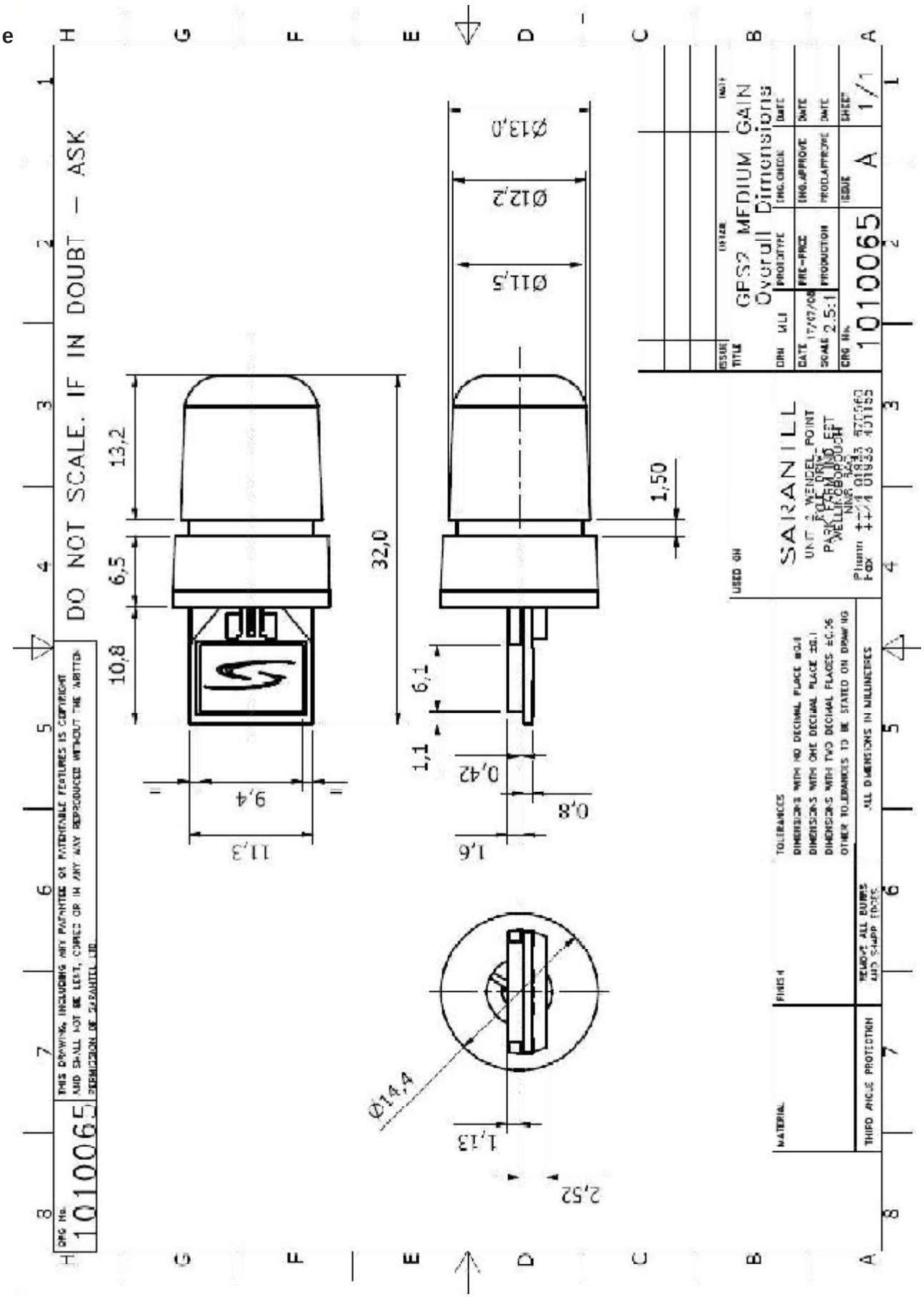
DO NOT SCALE. IF IN DOUBT – ASK
GPS2 MEDIUM GAIN
Overall Dimensions
SARANTEL
1010065
A
1/1
13,2
6,5
10,8
32,0
1,50
6,1
1,1
9,4
11,3
0,42
0,8
1,6
Ø13,0
Ø12,2
Ø11,5
Ø14,4
1,13
2,52

## RoSH Compliance Statement

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# RoHS/Lead-Free Compliance

Dear Sir / Madam:

This letter is intended to answer questions from our customers, partners and suppliers regarding the compliance of Sarantel Ltd products with the following EU directives:

- 2006/96: Waste Electrical and Electronic Equipment (WEEE)
- 2000/53: End of Life Vehicle (ELV)
- 2002/95: Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment (RoHS): (***effective 1st July 2006***)

The directives aim is to avoid or limit the use of hazardous materials such as lead, mercury, cadmium and hexavalent chromium, as well as brominated substances - PBDE (polybrominated diphenyl ethers) and PBB (polybrominated biphenyls).

Sarantel has shipped compliant product since ***1st January 2006*** and incorporated the requirements of 2002/95 into the product/technology development roadmaps. We are committed to the supply of lead-free/RoHS compliant devices in current and future product introductions.

Please contact your local sales representative should further information be required.

David Wither
Chief Executive Officer (CEO)

Bill Taylor
Chief Operating Officer (COO)

Andrew Christie
VP of Engineering

Ian Gerry
Director of Quality

Registered Office as above address

6th June 2008

## About Sarantel

Sarantel designs and manufactures dielectrically loaded antennas based on patented PowerHelix® filtering antenna technology. Sarantel's antennas are ideal for applications in which the radio device is small, handheld, or body-worn, or in devices with multiple transceivers and high levels of common mode noise. Sarantel antennas can be mounted externally or easily embedded within a device.

Sarantel antennas are protected by US patents 5854608, 5181297, 6424316, 5859621, 6369776; UK Patents 2297638, 2326532, 2326533, 2310543; and other granted or pending international patents.

GeoHelix®, PowerHelix®, and the Sarantel logo are registered trademarks of Sarantel Ltd.

## Application Support

Sarantel are committed to our customers' success, and so offer a variety of support options for customers designing RF products.

Check the Sarantel web site at sarantel.com/technology for the latest production specifications, technical notes, and application guides for solutions to the most common antenna integration issues.

Contact our applications support group by email at info@sarantel.com, info-asia@sarantel.com, or info-usa@sarantel.com for detailed product specifications, including mechanical drawings, surface mount pad layout, embedding recommendations, and other application questions not answered in the technical literature.

For further support options, please contact your local sales representative at www.sarantel.com/wheretobuy.

## Contact Sarantel

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