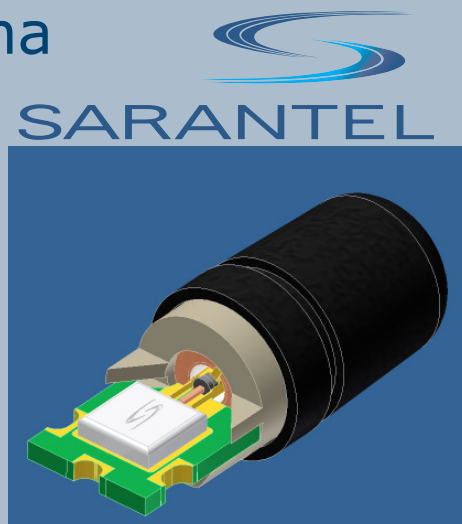


SL1204 (GeoHelix®-M)

2nd Generation Active GPS Antenna

Product Specification



Product Description

Built on patented PowerHelix® filtering antenna technology, the SL1204 surface-mount GPS antenna is the smallest active quadrifilar helix antenna available, providing high performance in difficult GPS applications. The SL1204 integrates a high-performance, optimised gain, low-noise amplifier with Sarantel's GeoHelix®-P2 antenna for receivers requiring an active input. The SL1204 has been optimally designed to work best with the latest generation of GPS chipsets. The SL1204 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.

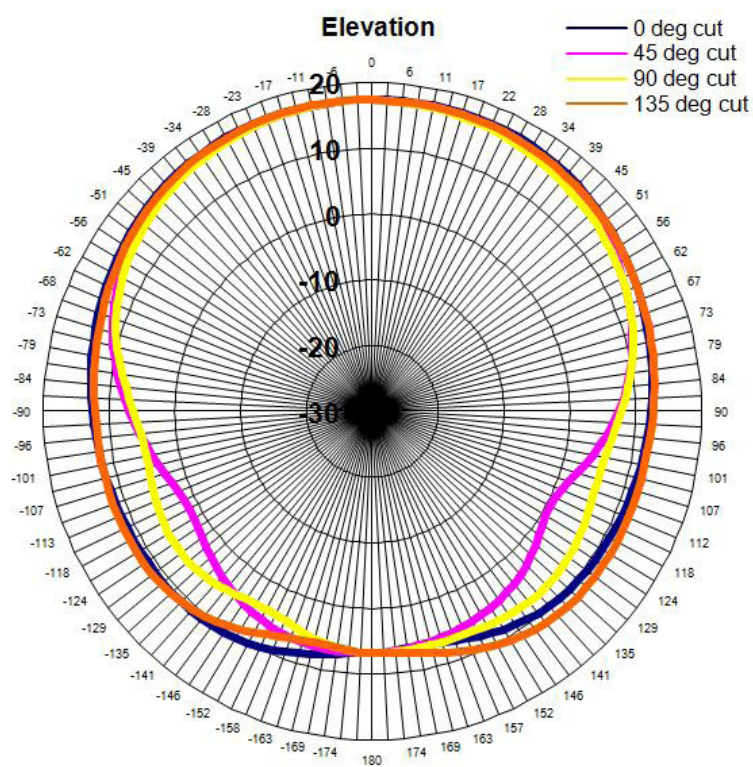
The SL1204 antenna is balanced, which isolates it from the device and enables the antenna to reject common mode noise resident on the device ground plane. The construction and materials of the antenna constrain its near-field to a very small volume, therefore materials near the antenna have negligible de-tuning effects and the antenna maintains its pattern and efficiency in the presence of dielectric loading. As a dielectrically -loaded antenna, the SL1204 antenna effectively attenuates signals from common GSM and ISM frequencies, minimizing the need for additional filtering.

The SL1204 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

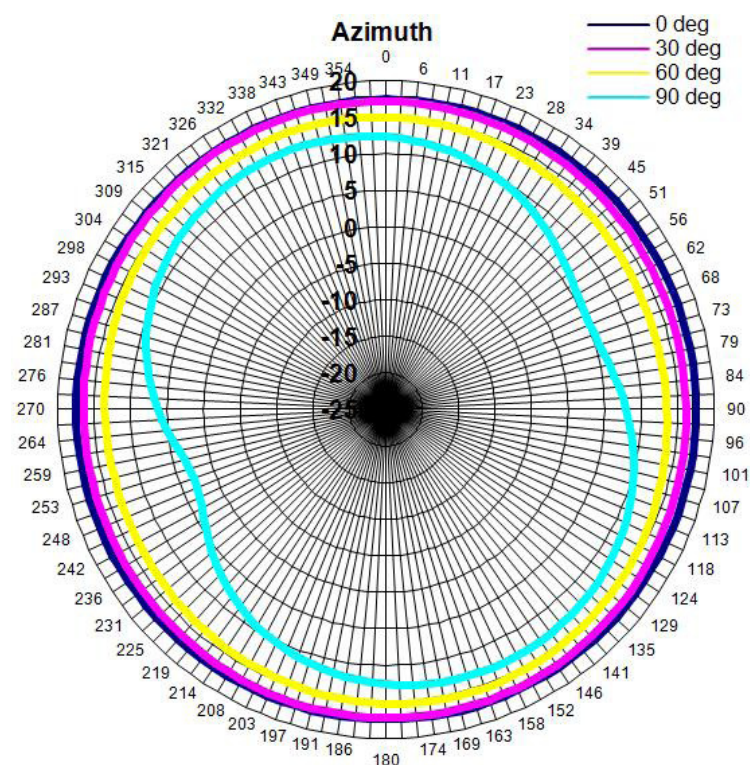
	Minimum	Typical	Maximum	Unit
Part Number	SL1204(see page 4 for detailed part numbers)			Each
Type	Quadrifilar Helix			
Frequency	1573.42	1575.42	1577.42	MHz
Polarization	Right-hand circular polarized			
Voltage	1.8	3.0	3.6	V
Current	3.1	3.4	3.9	mA
Gain	+17	+18		dBic
Beamwidth		135		Degrees
Bandwidth (3dB)		20		MHz
Axial Ratio		<2.0		@Zenith
VSWR		<2.0:1	2.3:1	
Impedance		50		
Noise Figure		0.8	0.9	dB
Input 3rd Order Intercept Point		-7		dBm
Operating Temperature	-40	+20	+85	°C
Element Dimensions	10 (diameter) x 17 (length)			mm
Overall Dimensions (w/radome)	13.3 (dia) x 12.4 (width) x 34 (length)			mm
Weight (excl radome or sleeve)	7.0			grams
Mounting	SMT			

Radiation Patterns (dBic)



The SL1204, with optimised LNA gain and low-noise figure, provides a typical gain and Noise Figure of 18dBic and 0.8dB, respectively.

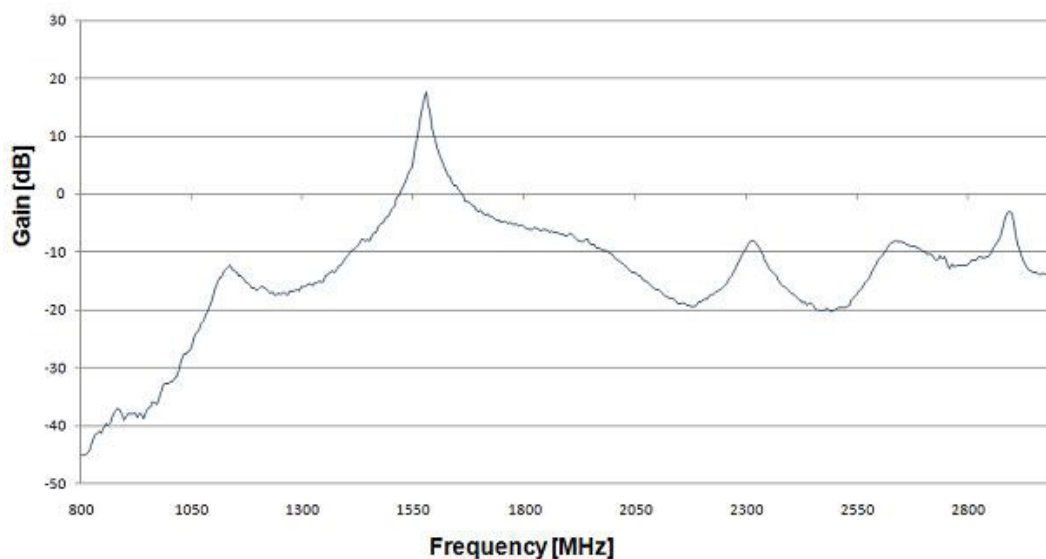
This antenna is designed to work efficiently with the latest generation of GPS chipsets out in the market today.



The strength of the PowerHelix® antenna technology is its immunity to de-tuning in the presence of dielectric loading, like human tissues. The SL1204 antenna retains efficiency and polarization near the human body. Conventional antennas lose 5-10dB of gain in similar circumstances.

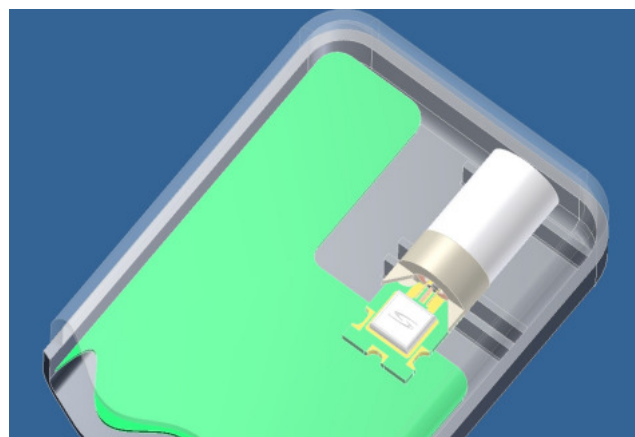
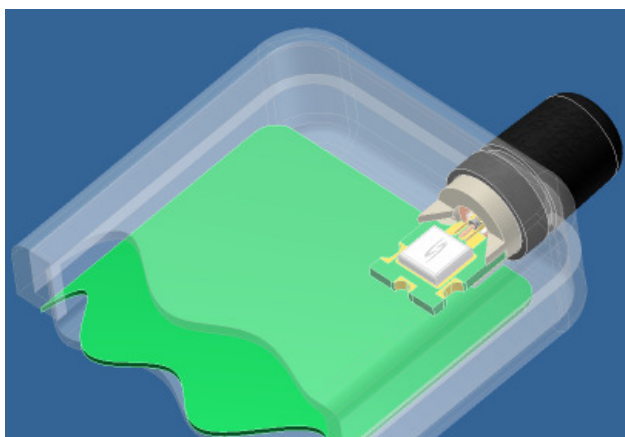
Though it will not electrically couple with a ground plane, the SL1204 antenna can be expected to increase efficiency by up to 100% when mounted over a ground plane due to near-field signal reflections. Configuration and orientation of the ground plane with respect to the antenna will vary results, but efficiency will not decrease.

Filtering Response



Frequency (MHz)		S_{12} (dB)
860	GSM 900	-40
970		-37
1575.42	GPS (L1)	+18
1700	GSM 1800	-4
1800		-7
1900		-9
2450	Bluetooth/Wifi	-21

Antenna Integration Options



The SL1204 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. Internally embedded antenna requires support ribs in the plastic housing. For further information on integrating the SL1204, please refer to the integration guidelines.

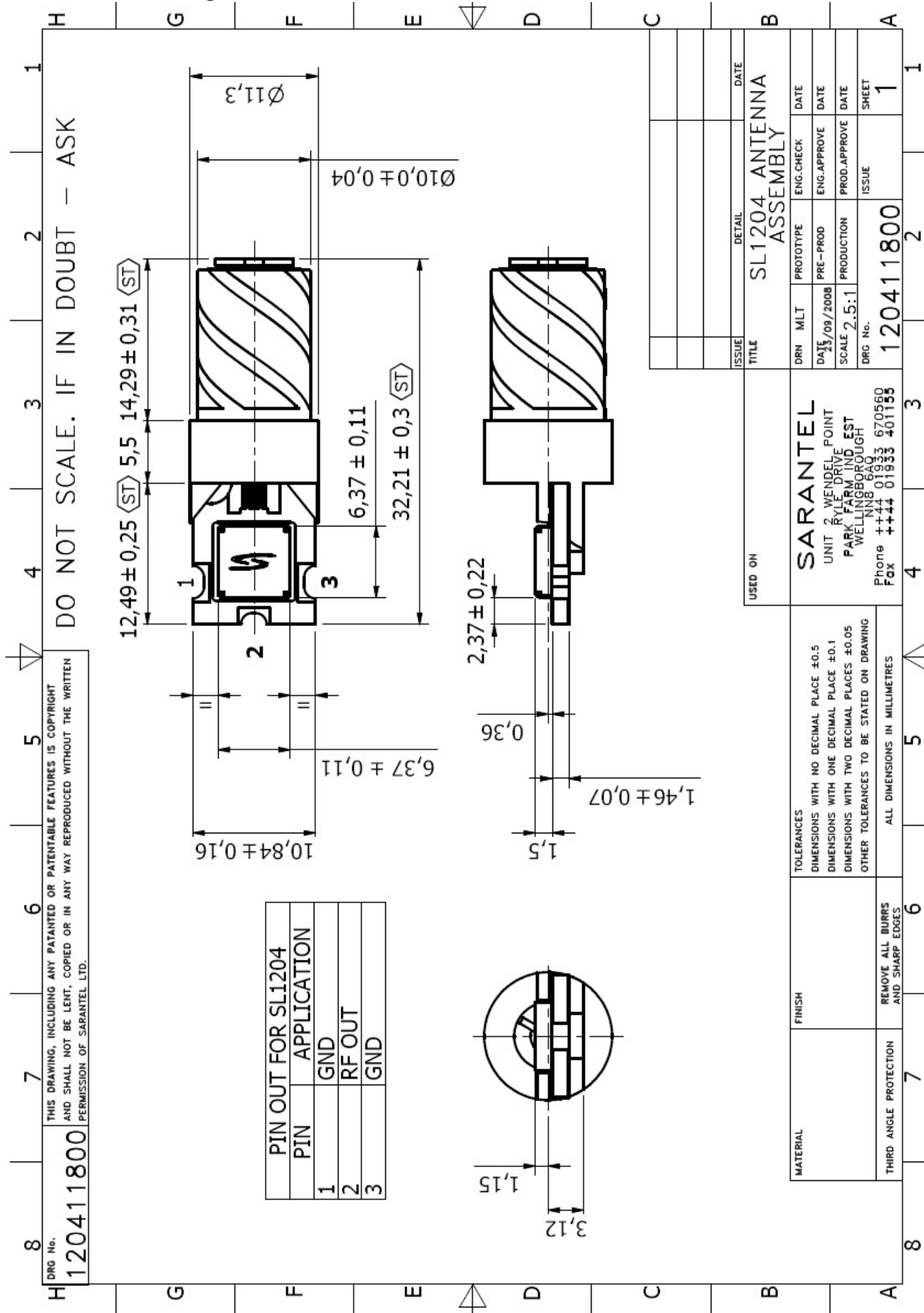
Ordering Guide for the SL1204 antenna

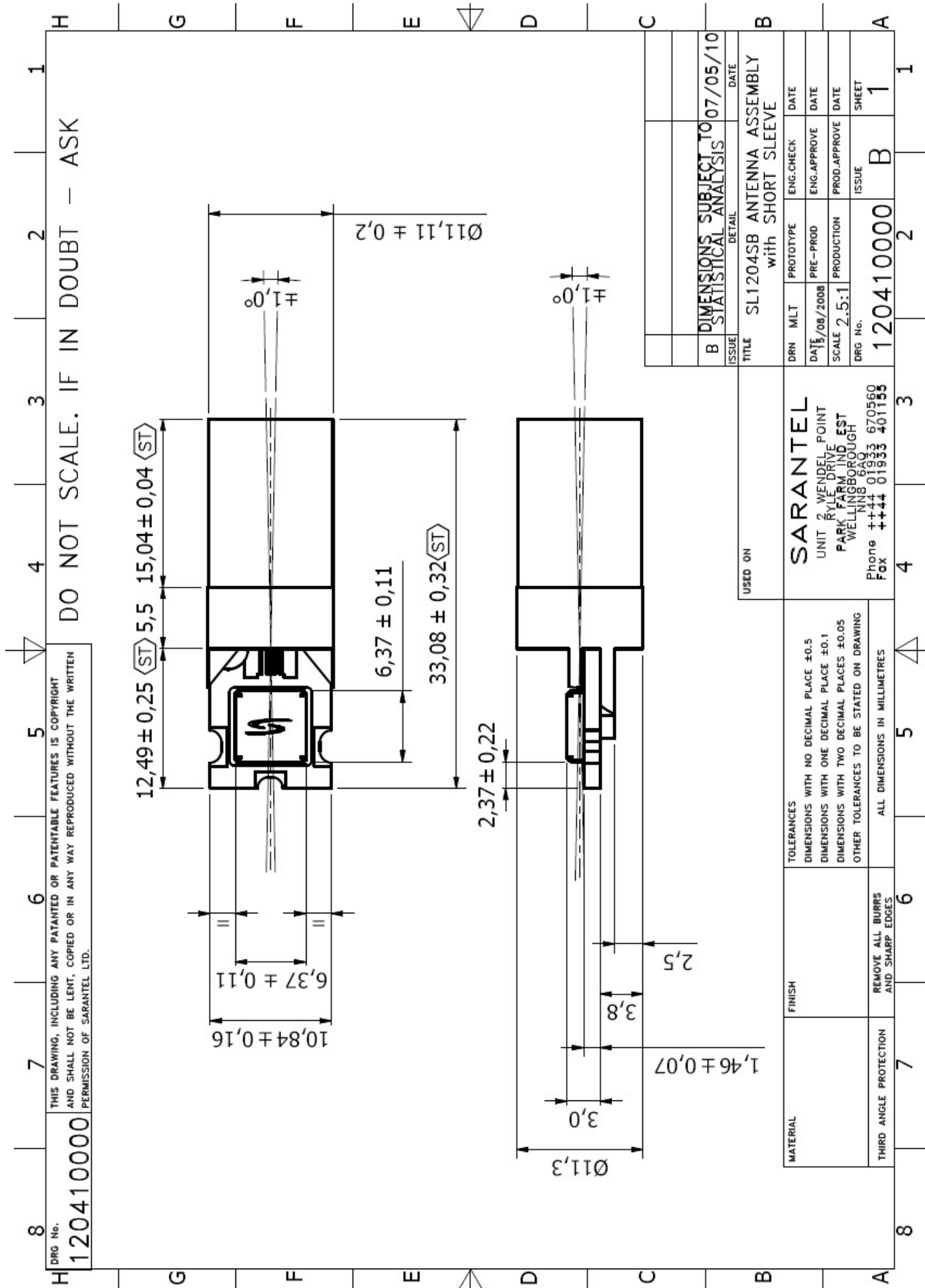
Part Number	Description	MOQ	Pack Size
SL1204	GeoHelix® M Antenna	400	400
SL1204R	GeoHelix® M Antenna with Radome	400	400
SL1204SB	GeoHelix® M Antenna with Short Sleeve	400	400

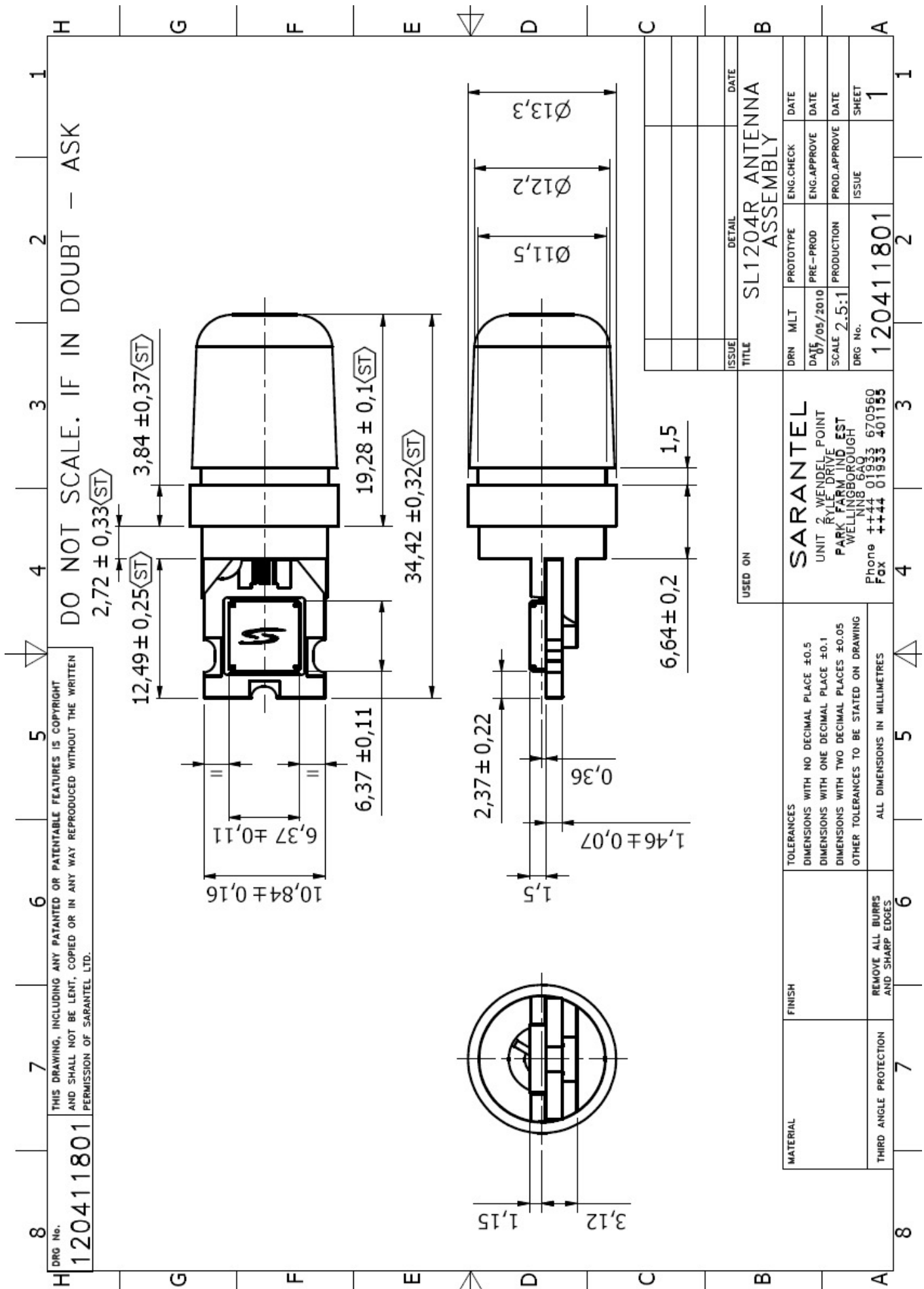
Notes

1. Orders placed for below MOQ or not in multiples of pack quantities will be subject to a \$20 handling fee
2. For further guidance on selecting the correct part number please contact Sarantel distributors or

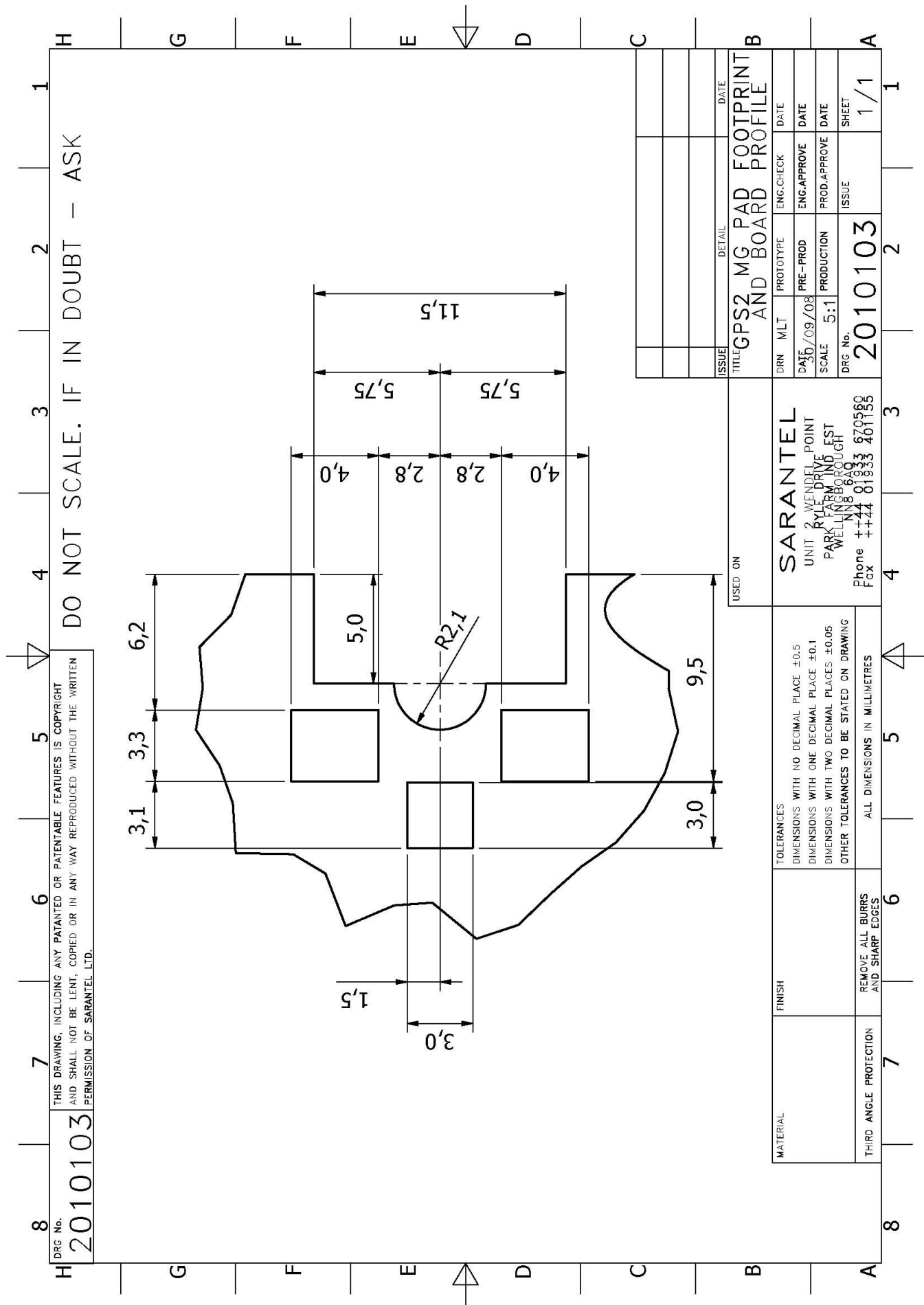
Mechanical Drawings - Overall Dimensions







Mechanical Drawings - Footprint and Board Profile





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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)
- 1907/2006 Regulation on the registration, evaluation and authorisation of Chemicals (REACH)

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 diphenol ethers) and PBB (polybrominated biphenyls).


Also in accordance with Article 33 of REACH we will supply relevant data on the composition of any Articles containing substances of Very High Concern (SVHCs).

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.

A handwritten signature in black ink, appearing to read 'David Wither', positioned above a dotted line.

David Wither
Chief Executive Officer

A handwritten signature in black ink, appearing to read 'Mark Dowsett', positioned above a dotted line.

Mark Dowsett
Director of Quality

Registration No.: 03960217

VAT No.: GB 754 6304 29

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 and other granted or pending international patents.

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

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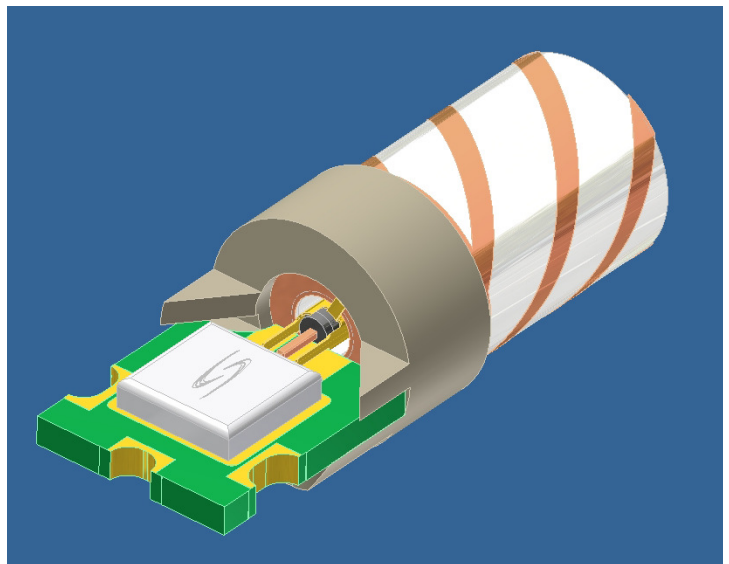
Application Support

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/products 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 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.



Sarantel strongly believes in the value of intellectual property and the right of entrepreneurs to protect what they have created. Sarantel demonstrates its commitment to this principle by continuously developing its technology and then filing patents in a number of regions around the world. Additionally, Sarantel is constantly filing new patent applications and has a substantial portfolio of pending applications.

A list of Sarantel's granted patents;

Australia: 707488, 716542, 720873, 769570, 2004223229 **Austria:** 0791978 **Brazil:** PI9508769-9 **Canada:** 2198318, 2198375, 2245882, 2250790, 2272389, 2357041, 2373941, 2521493 **China:** ZL00136656.4, ZL00803562.8, ZL00808144.1, ZL95195772.4, ZL97181567.4, ZL97193099.6, ZL97194742.2, ZL99816387.2 **Denmark:** 0777922, 1088367 **Finland:** 0791978, 0876688, 0935826, 0941557, 1088367, 1098392, 1147571, 1153458, 1196963, 1609213 **France:** 0777922, 0791978, 0876688, 0935826, 0941557, 1081787, 1088367, 1098392, 1147571, 1153458, 1196963, 1609213 **Germany:** 60003157.8-0, 60029538.9-08, 60034042.2-08, 602004010085.4-08, 69535431.0-08, 69722590.9-0, 69723093.7-0, 69726177.8-0, 69730369.1-08, 69923558.8-08, 69930407.5-08 **India:** 193515, 193751, 193929, 195085, 206740 **Italy:** 0777922, 0791978, 0876688, 0935826, 1081787, 1088367, 1153458, 1196963 **Japan:** 3489684, 3489775, 3923530, 3946955, 4052800, 4057612, 4077197, 4099309, 4147260, 4159749, 4188412 **Malaysia:** MY-112473-A, MY-119077-A, MY-119465-A, MY-123075-A **Mexico:** 199890, 205239, 213947, 220048, 213633, 232437, 232438, 231633, 259577 **Netherlands:** 0791978, 1081787 **New Zealand:** 291852, 334614 **Philippines:** 1-1995-51169, 1-1997-55284, 1-1997-55978, 1-1997-58557, 1-1999-03167 **Russia:** 2173009, 2210146, 2339131 **Singapore:** 37745, 54891, 56480, 116791, 131698 **South Korea:** 348441, 366071, 446790, 458310, 523092, 625638, 650620, 650621, 650622, 663873, 667216, 667221, 709688, 767329 **Spain:** 0777922, 0791978, 1088367, 1196963 **Sweden:** 0777922, 0791978, 0876688, 0935826, 0941557, 1081787, 1088367, 1098392, 1147571, 1153458, 1196963, 1609213 **Switzerland:** 0791978, 1081787, 1196963 **Taiwan:** 094978, 108488, 123671, 144801, 156702, 285980, M 312023 **Thailand:** 17812, 19360, 19570, 23745 **United Kingdom:** 1081787, 1147571, 2292257, 2292638, 2309592, 2310543, 2311675, 2321785, 2326532, 2326533, 2338605, 2351850, 2356086, 2367429, 2383901, 2399948, 2419037 **USA:** 5854608, 5859621, 5945963, 5963180, 6181297, 6184845, 6300917, 6369776, 6424316, 6552693, 6690336, 6886237, 6914580, 7256752, 7372427, 7408515