

## ANT-GPS-SH2-ccc

# Data Sheet

### Product Description

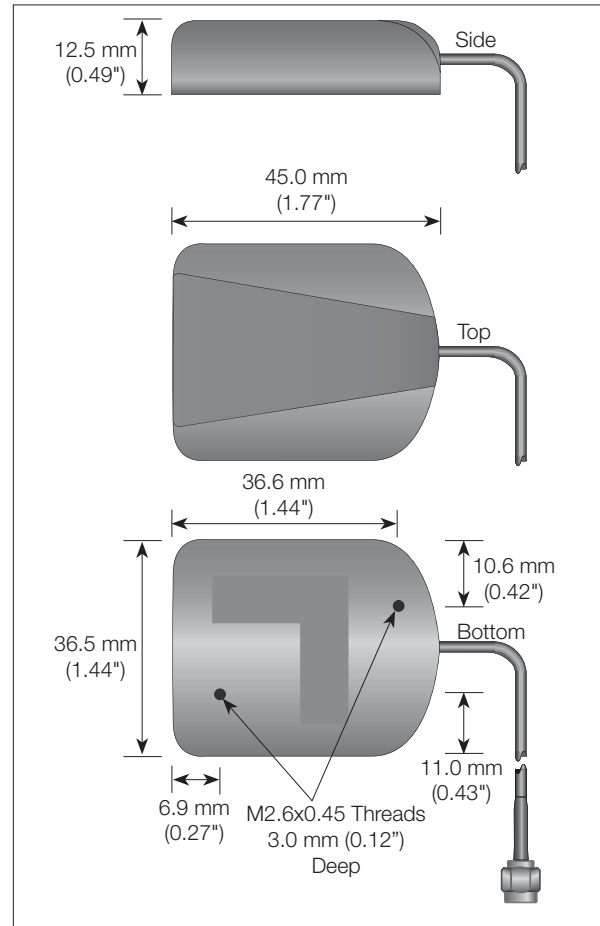
Covering both GPS and GLONASS frequencies, The high-performance SH2 Series GPS antennas combine superior performance and low power consumption. They are designed to survive the weather with an IP66 rating and UV stabilized plastic and cable. This makes them ideal for telematics, fleet management, navigation, tracking and other applications that require a compact, high-performance GPS antenna. For maximum compatibility with the host receiver, the SH2 accepts supply voltages from 2.5 to 5.5VDC and is protected against shorts, over current, or reverse polarity situations. The antennas attach via a SMA, MCX, MMCX or customer-specified connector.

### Features

- Compact
- High-gain, low-noise design
- Low current consumption
- Protection circuit
- UV protection
- IP66 rating
- Rugged & damage-resistant
- Magnetic mount

### Electrical Specifications

Center Frequency:	1575.42MHz, 1602MHz
Bandwidth:	10MHz @ -3dB point
VSWR:	1.5 typ.
Antenna Peak Gain:	5.0dB typ.
Impedance:	50-ohms
Axial Ratio:	1.0dB typ.
Elev. Angle Cov.:	5–90 degrees
Az. Bearing Cov.:	360 degrees
Polarization:	RHCP
System Gain:	28±1dB typ. (includes 3m cable & filter loss)
Noise Figure:	1.0dB typ.
Input Voltage:	+2.5 to +5.5VDC
Current:	5–8mA typ. @ 5V
Mounting:	Magnetic and/or screw



Cable:	117" +/-6" (3m) RG-174U (Low-loss, 0.7dB/m)
Connection:	SMA, MCX, MMCX <sup>1</sup>
Weight:	2.79oz (79g)
Plastic UV Resistance:	UL-746C f1
Cable UV Resistance:	UL-758
Ingress Protection:	IP66
Oper. Temp. Range:	-40°C to +85°C <sup>2</sup>

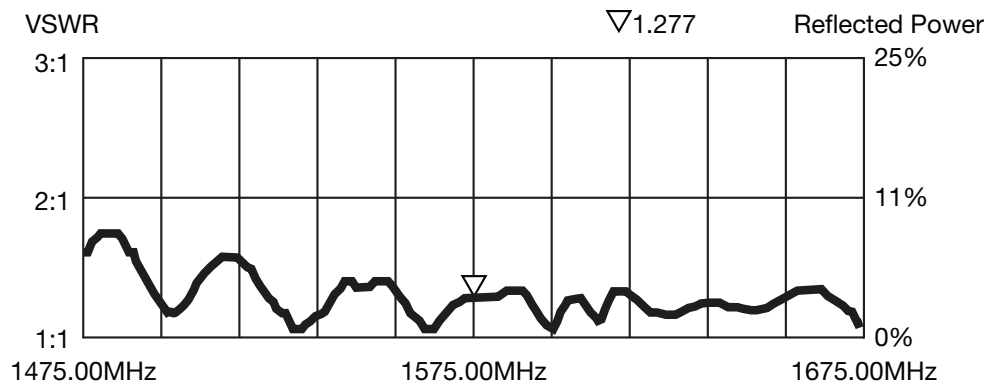
### Ordering Information

ANT-GPS-SH2-SMA (with SMA connector)  
ANT-GPS-SH2-MCX (with MCX connector)  
ANT-GPS-SH2-MMX (with MMCX connector)

<sup>1</sup> Contact Linx for custom cable lengths and connectors.

<sup>2</sup> Operation below -30°C may result in a slightly longer time to first fix.

## VSWR Graph



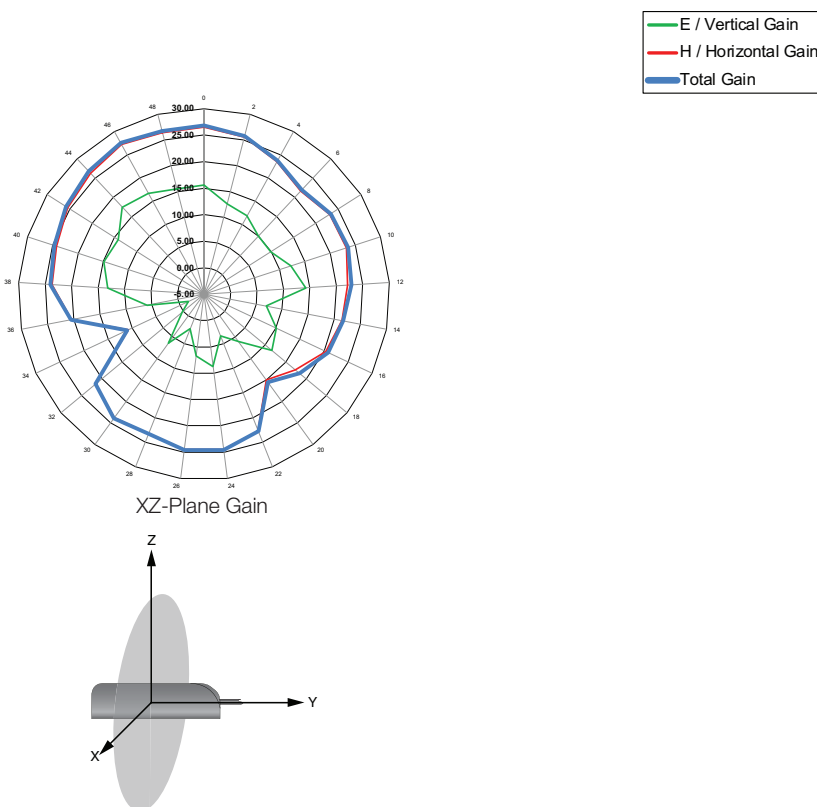
### What is VSWR?

The Voltage Standing Wave Ratio (VSWR) is a measurement of how well an antenna is matched to a source impedance, typically 50-ohms. It is calculated by measuring the voltage wave that is headed toward the load versus the voltage wave that is reflected back from the load. A perfect match has a VSWR of 1:1. The higher the first number, the worse the match, and the more inefficient the system. Since a perfect match cannot ever be obtained, some benchmark for performance needs to be set. In the case of antenna VSWR, this is usually 2:1. At this point, 88.9% of the energy sent to the antenna by the transmitter is radiated into free space and 11.1% is either reflected back into the source or lost as heat on the structure of the antenna. In the other direction, 88.9% of the energy recovered by the antenna is transferred into the receiver. As a side note, since the “:1” is always implied, many data sheets will remove it and just display the first number.

### How to Read a VSWR Graph

VSWR is usually displayed graphically versus frequency. The lowest point on the graph is the antenna's operational center frequency. In most cases, this is different than the designed center frequency due to fabrication tolerances. The VSWR at that point denotes how close to 50-ohms the antenna gets. Linx specifies the recommended bandwidth as the range where the typical antenna VSWR is less than 2:1.

## Gain Plots

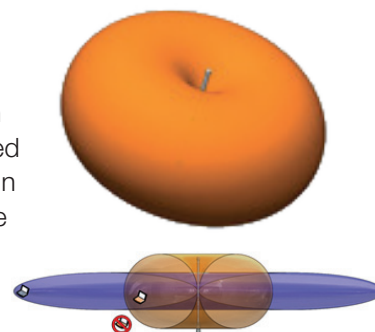


### About Gain Plots

The true measure of the effectiveness of an antenna in any given application is determined by the gain and radiation pattern measurement. For antennas gain is typically measured relative to a perfect (isotropic) radiator having the same source power as the antenna under test, the units of gain in this case will be decibels isotropic (dBi). The radiation pattern is a graphical representation of signal strength measured at fixed distance from the antenna.

Gain when applied to antennas is a measure of how the antenna radiates and focuses energy into free space. Much like a flashlight focuses light from a bulb in a specific direction, antennas focus RF energy into specific directions. Gain in this sense refers to an increase in energy in one direction over others.

It should also be understood that gain is not “free”, gain above 0dBi in one direction means that there must be less gain in another direction. Pictorially this can be pictured as shown in the figures to the right. The orange pattern represents the radiation pattern for a perfect dipole antenna, which is shaped like a donut. The pattern for an omnidirectional antenna with gain is shown in blue. The gain antenna is able to work with a device located further from the center along the axis of the pattern, but not with devices closer to the center when they are off the axis – the donut has been squished.



Gain is also related to the overall physical size of the antenna, as well as surrounding materials. As the geometry of the antenna is reduced below the effective wavelength (considered an electrically small antenna) the gain decreases. Also, the relative distance between an electrically small antenna and its associated ground impacts antenna gain.

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