

# HC977E



When precision matters.®

## HC977E Embedded Triple-Band Helical Antenna + L-band

Frequency Coverage: L1/L2/L5/G1/G2/G3/E1/E5a/E5b/B1/B2/B2a + L-band

### Overview

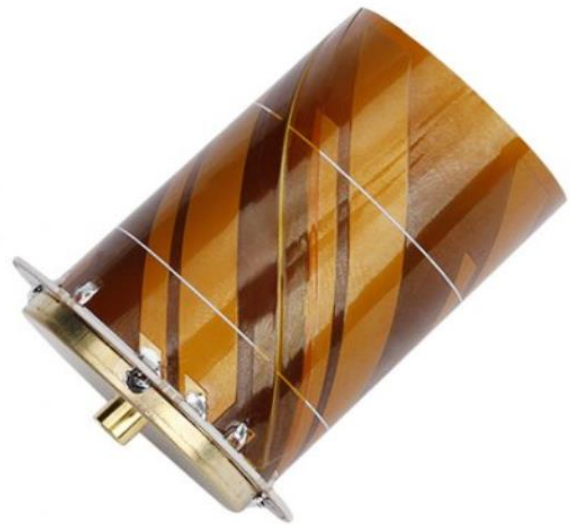
The lightweight HC977E helical antenna is designed and crafted for precision positioning and covers the GPS/QZSS-L1/L2/L5, GLONASS-G1/G2/G3, Galileo-E1/E5a/E5b, and BeiDou-B1/B2/B2a frequency bands, as well as L-band correction services.

Weighing only 12 g, the HC977E features a precision-tuned helix element that provides excellent axial ratios and operates without the requirement of a ground plane, making it ideal for a wide variety of applications including unmanned aerial vehicles (UAVs).

The HC977E features an industry-leading low current, low noise amplifier (LNA) that includes an integrated low-loss pre-filter to protect against harmonic interference from high amplitude interfering signals, such as 700 MHz band LTE and other near in-band cellular signals.

Tallysman's provides an embedded helical antenna mounting ring that traps the outer edge of the circuit board to another circuit board or to any flat surface. To facilitate a successful installation and optimum antenna performance, Tallysman also provides an Embedded Helical Antenna Installation Guide.

\*The HC977E replaces the HC975E.



### Applications

- Autonomous unmanned aerial vehicles (UAVs)
- Precision GNSS positioning
- Precision land survey positioning
- Mission-critical GNSS timing
- Safety & security
- Network timing & synchronization

### Features

- Very low noise preamp: 1.6 dB
- Axial ratio:  $\leq 0.5$  dB at zenith
- LNA gain: 28 dB typ. or 35 dB typ.
- Low current: 15 mA typ. or 21 mA typ.
- ESD circuit protection: 15 kV
- Invariant performance from: 2.2 to 16 VDC
- IP67, REACH, and RoHS compliant

### Benefits

- Extremely lightweight (12 g)
- Ideal for L1/L2/L5, E1/E5a/E5b RTK surveying systems
- Great multipath rejection
- Increased system accuracy
- Excellent signal-to-noise ratio

**About Tallysman:** With global headquarters and manufacturing in Ottawa, Canada, Tallysman is a leading manufacturer of high-precision antennas and components for Global Navigation Satellite System (GNSS) applications. Tallysman's mission is to support the needs of a new generation of positioning systems by delivering unprecedented antenna precision at competitive prices. Learn more at [www.tallysman.com](http://www.tallysman.com)

Revision: 1.0

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## Antenna

Technology Triple frequency, RHCP quadrifilar helix

		Gain dBic typ. at Zenith	Axial Ratio dB at Zenith
<b>GNSS</b>			
GPS / QZSS	L1	2.5	≤ 0.5
	L2	2.0	≤ 0.5
	L5	0.3	≤ 0.5
GLONASS	G1	1.4	≤ 0.5
	G2	0.5	≤ 0.5
	G3	2.1	≤ 0.5
Galileo	E1	2.5	≤ 0.5
	E5A	0.3	≤ 0.5
	E5B	2.2	≤ 0.5
	E6	-	-
BeiDou	B1	2.5	≤ 0.5
	B2	2.2	≤ 0.5
	B2a	0.3	≤ 0.5
	B3	-	-
IRNSS / NavIC	L5	0.3	≤ 0.5
QZSS	L6	-	-
L-Band Services (1525 MHz - 1559 MHz)		1.5	≤ 0.5
<b>Satellite Communications</b>			
Iridium		-	-
Globalstar		-	-
<b>Other</b>			
Axial Ratio at 10°	-	Efficiency	-
PC Variation	-		

## Mechanicals

Size	38.7 mm (dia.) x 49.7 mm (h.)
Weight (including O-Ring)	12 g
Available connectors	MCX
Radome	-
Mount	Tallysman compression ring

## Environmental

Operating Temperature	-40 °C to +85 °C
Storage Temperature	-50 °C to +95 °C
Vibration	MIL STD 810D - 2 hr per axis (X,Y,Z)
Shock	-
Salt Fog	-
IP Rating	-
Compliance	IPC-A-610, FCC, RED / CE Mark, RoHS, REACH

## Warranty:

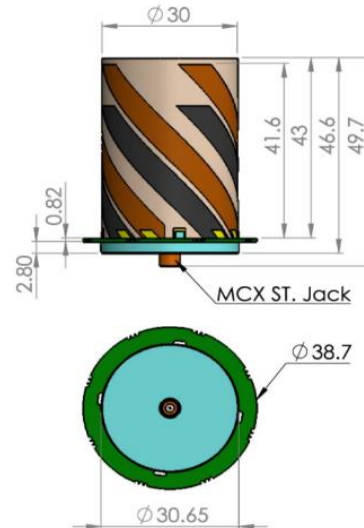
Parts and Labour	One year (extended warranty available)
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## Low Noise Amplifier (LNA) - Measured at 3V and 25°C

Frequency Bandwith		Out of Band Rejection	
		Upper Band	Lower Band
1525 - 1606 MHz	1164 - 1254 MHz	< 1400 MHz > 36 dB < 1450 MHz > 44 dB > 1700 MHz > 28 dB	< 1000 MHz > 63 dB < 1100 MHz > 38 dB < 1325 MHz > 57 dB

Architecture	pre-filter → LNA
Gain	28 dB typ. or 35 dB typ.
Noise Figure	1.6 dB typ.
VSWR	< 1.5:1 typ.   1.8:1 max.
Supply Voltage Range	2.2 to 16 VDC
Supply Current	15 mA typ. (28 dB)   21 mA typ. (35 dB)
ESD Circuit Protection	15 kV air discharge
P 1dB Output	L1 - 22.7 dBm   L2, L5 - 25.1 dBm
Group Delay	2 ns @ L1   5 ns @ L2

## Mechanical Diagram



## Ordering Information

Part Number **33-HC977E-xx**

where xx = Gain in dB

Please refer to our **Ordering Guide** to review available radomes and connectors at:  
<https://www.tallysman.com/resource/tallysman-ordering-guide/>