

# HC871E

## HC871E Embedded Dual-Band Helical Antenna

Frequency Coverage: GNSS/QZSS-L1/L2, GLONASS-G1/G2, Galileo-E1, BeiDou-B1

The patented HC871E embedded helical antenna is designed for precision positioning, covering the GPS/QZSS-L1/L2, GLONASS-G1/G2, Galileo-E1, and BeiDou-B1 frequency bands, including the satellite-based augmentation system (SBAS) available in the region of operation [WAAS (North America), EGNOS (Europe), MSAS (Japan), or GAGAN (India)].

Weighing only 8 g, The light and compact HC871E 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 HC871E features an industry-leading low current, low-noise amplifier (LNA) that includes an integrated low-loss pre-filter to prevent harmonic interference from high-amplitude signals, such as 700 MHz band LTE and other nearby in-Band cellular signals.

Tallysman provides an optional embedded helical mounting ring, which traps the outer edge of the antenna circuit board to the host circuit board or to any flat surface. Tallysman also provides support for installation and integration of embedded helical antennas to enable the integrator to achieve a successful installation and obtain optimum antenna performance.

For mounting instructions, visit:  
[https://www.tallysman.com/downloads/Helical\\_Mounting\\_Instruction.pdf](https://www.tallysman.com/downloads/Helical_Mounting_Instruction.pdf)



### Applications

- Autonomous unmanned aerial vehicles (UAVs)
- Precision GNSS positioning
- Precision land survey positioning
- Mission-critical GNSS timing
- Network timing and synchronization
- Sea and land container tracking
- Fleet management and asset tracking
- Marine and avionics systems
- Law enforcement and public safety

### Features

- Very low noise preamp (2.0 dB typ.)
- Axial ratio ( $\leq 0.5$  dB at zenith)
- LNA gain (28 dB typ.)
- Low current (15 mA typ.)
- ESD circuit protection (15 kV)
- Invariant performance from 2.2 to 16 VDC
- REACH and RoHS compliant

### Benefits

- Extremely light (5 g)
- Ideal for RTK and PPP surveying systems
- Excellent RH circular polarized signal reception
- Great multipath rejection
- Increased system accuracy
- Excellent signal-to-noise ratio
- Industrial temperature range

**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)

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## Antenna

Technology: Dual-frequency, RHCP quadrifilar helix

|                              |     | Gain                | Axial Ratio  |
|------------------------------|-----|---------------------|--------------|
|                              |     | dBic typ. at Zenith | dB at Zenith |
| <b>GNSS</b>                  |     |                     |              |
| GPS / QZSS                   | L1  | 1.6                 | ≤ 0.5        |
|                              | L2  | 1.7                 | ≤ 0.5        |
|                              | L5  | -                   | -            |
| GLONASS                      | G1  | 1.2                 | ≤ 0.5        |
|                              | G2  | 1.7                 | ≤ 0.5        |
|                              | G3  | -                   | -            |
| Galileo                      | E1  | 1.6                 | ≤ 0.5        |
|                              | E5a | -                   | -            |
|                              | E5b | -                   | -            |
|                              | E6  | -                   | -            |
| BeiDou                       | B1  | 1.6                 | ≤ 0.5        |
|                              | B2  | -                   | -            |
|                              | B2a | -                   | -            |
|                              | B3  | -                   | -            |
| IRNSS / NavIC                | L5  | -                   | -            |
| QZSS                         | L6  | -                   | -            |
| L-band correction services   |     |                     |              |
| Satellite Communications     |     |                     |              |
| Iridium                      | -   | -                   | -            |
| Globalstar                   | -   | -                   | -            |
| Phase Centre                 |     |                     |              |
| Phase Centre Variation (PCV) | -   | -                   | -            |
| Phase Centre Offset (PCO)    | -   | -                   | -            |

## Mechanicals

|                      |                                     |
|----------------------|-------------------------------------|
| Mechanical Size      | 27.5 mm (dia.) x 49.6 mm (h.)       |
| Weight               | 5 g                                 |
| Available Connectors | MCX (female)                        |
| Radome / Enclosure   | -                                   |
| Mount                | Helical mounting ring P/N 23-0219-0 |

## Environmental

|                       |  |
|-----------------------|--|
| Operating Temperature | -45 °C to +85 °C                           |
| Storage Temperature   | -55 °C to +95 °C                           |
| Random Vibration      | -  |
| Shock and Drop        | -  |
| Salt Fog              | -  |
| IP Rating (housing)   | n/a  |
| Compliance            | IPC-A-610, FCC, RED / CE Mark, RoHS, REACH |

## Warranty:

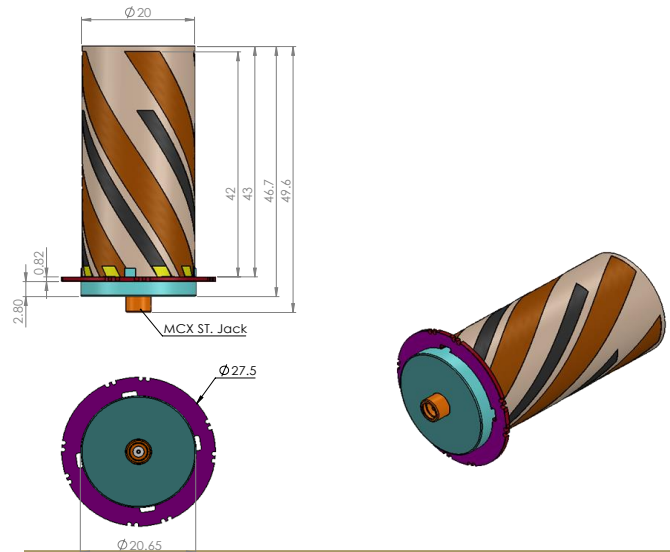
|                  |                          |
|------------------|--------------------------|
| Parts and Labour | 1-year standard warranty |
|------------------|--------------------------|

## Low Noise Amplifier (LNA) - Measured at 3.0 VDC and 25°C

| Frequency Bandwidth | Out-of-Band Rejection   |
|---------------------|---|
| Lower Band          | 1217 - 1255 MHz<br>> 46 dB @ < 1100 MHz<br>> 40 dB @ < 1190 MHz   |
| Upper Band          | 1559 - 1606 MHz<br>> 48 dB @ < 1400 MHz<br>> 39 dB @ < 1500 MHz<br>> 38 dB @ > 1625 MHz<br>> 57 dB @ > 1700 MHz |

|                        |                           |
|------------------------|---------------------------|
| Architecture           | Pre-filter → LNA          |
| Gain                   | 28 dB typ.   26 dB min.   |
| Noise Figure           | 2.0 dB typ.               |
| VSWR                   | < 1.5:1 typ.   1.8:1 max. |
| Supply Voltage Range   | 2.2 to 12 VDC             |
| Supply Current         | 15 mA typ.                |
| ESD Circuit Protection | 15 kV air discharge       |
| P 1dB Output           | 10 dBm @ L1               |
| Group Delay Variation  | 15 ns @ L1   10 ns @ L2   |

## Installation Instructions



## Ordering Information

Part Number: **33-HC871E**

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