

# HC843E

## HC843E Embedded Active Dual-Band GNSS + Passive Iridium Helical Antenna

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

The patented dual-purpose (GNSS and Iridium signal reception) HC843E embedded helical antenna is designed for precision positioning within 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)]. The HC843E also passively supports communications over voice and data modems on the Iridium<sup>®</sup> frequency band (1616.0 - 1626.5 MHz).

The HC843E is switchable between the passive Iridium and the active GNSS antenna: an input voltage lower than 5.2 VDC engages the GNSS antenna, while an input voltage above of 5.5 and above invokes the passive Iridium antenna..

Weighing only 8 g, the light and compact HC843E 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 HC843E 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 (PN: 23-0220-0 for the HC843E), 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

- Iridium<sup>®</sup> voice and data 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

- Low noise preamp (3.0 dB typ.)
- Axial ratio ( $\leq 0.5$  dB at zenith)
- LNA gain (25 dB typ. | 24 dB min.)
- Low current (GNSS - 23 mA typ. | Iridium - 3.6 mA typ.)
- ESD circuit protection (15 kV)
- Invariant performance from 2.5 to 16 VDC
- GNSS-mode: 2.5 to 5.0 VDC
- Iridium-mode: 5.5 to 16 VDC
- IP67, REACH, and RoHS compliant

### Benefits

- Extremely light (8 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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Frequency Coverage: GNSS/QZSS-L1/L2, GLONASS-G1/G2, Galileo-E1, BeiDou-B1 + Passive Iridium

## Antenna

Technology Dual-frequency, RHCP quadrifilar helix

		Gain	Axial Ratio
		dBic typ. at Zenith	dB at Zenith
GNSS			
GPS / QZSS	L1	2.2	≤ 0.5
	L2	2.4	≤ 0.5
	L5	-	-
GLONASS	G1	2.6	≤ 0.5
	G2	2.1	≤ 0.5
	G3	-	-
Galileo	E1	2.2	≤ 0.5
	E5a	-	-
	E5b	-	-
	E6	-	-
BeiDou	B1	2.2	≤ 0.5
	B2	-	-
	B2a	-	-
	B3	-	-
IRNSS / NavIC	L5	-	-
QZSS	L6	-	-
L-band correction services		-	-
Satellite Communications			
Iridium		2.5	≤ 0.5
Globalstar		-	-
Phase Centre			
Phase Centre Variation (PCV)		-	
Phase Centre Offset (PCO)		-	

## Mechanicals

Mechanical Size	38.7 mm (dia.) x 49.7 mm (h.)
Weight	8 g
Available Connectors	MCX (female)
Radome / Enclosure	-
Mount	Helical mounting ring P/N 23-0220-0

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

Frequency Bandwidth		Out-of-Band Rejection
Lower Band	1217 - 1255 MHz	> 35 dB @ < 1100 MHz > 30 dB @ < 1200 MHz
Upper Band	1559 - 1626.5 MHz	> 36 dB @ < 1400 MHz > 40 dB @ < 1500 MHz > 38 dB @ > 1625 MHz > 45 dB @ > 1700 MHz

Architecture	Pre-filter → LNA
Gain	25 dB typ.   24 dB min
Noise Figure	3.0 dB typ.
VSWR	< 1.5:1 typ.   2.0:1 max.
Supply Voltage Range	GNSS: 2.5 to 5.0 VDC   Iridium: 5.5 to 16 VDC
Supply Current	GNSS: 23 mA typ.   Iridium: 3.6 mA typ.
ESD Circuit Protection	15 kV air discharge
P 1dB Output	10 dBm @ L1
Group Delay Variation	15 ns @ L1   12 ns @ L2

## Installation Instructions

## Ordering Information

Part Number	<b>33-HC843E</b>
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Please refer to our **Ordering Guide** to review available radomes and connectors at:  
<https://www.tallysman.com/resource/tallysman-ordering-guide/>