

TWA928LXF

TWA928LXF AccuAuto Embedded Autonomous Vehicle Triple-Band GNSS Antenna + L-Band

Frequency Coverage: GPS/QZSS-L1/L2/L5, GLONASS-G1/G2/G3, Galileo-E1/E5a/E5b, BeiDou-B1/B2/B2a, NavIC-L5
+ L-Band correction services

Overview

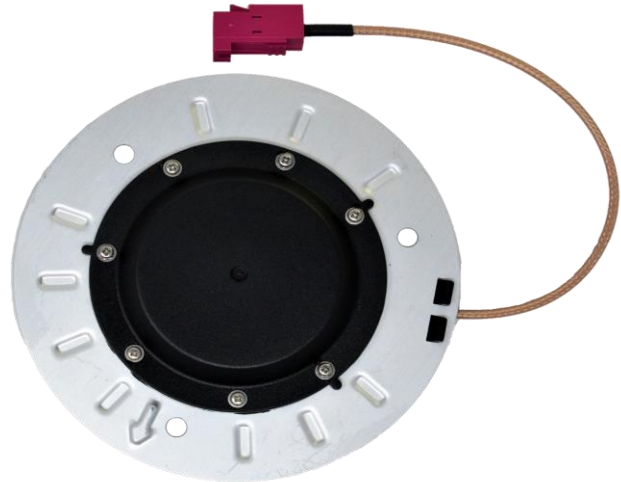
The Tallysman® TWA928LXF AccuAuto Embedded Autonomous Vehicle antenna has been designed to meet the demanding needs of the autonomous vehicle market. It features a patented Tallysman® Accutenna® technology multi-constellation and multi-frequency antenna element. This antenna features an integrated ground plane, radome, and underside cover that provides mist and condensation protection. The bottom cover also supports the antenna cable and mitigates cable vibration to ensure the antenna has a long service life, while the ground plane improves antenna performance. All TWA928LXF electronic components are Automotive Electronics Council (AEC) certified, designed to perform under the most challenging environmental conditions, such as extreme temperatures, continuous shock, and vibration.

The patent-pending TWA928LXF antenna employs Tallysman's unique Accutenna® technology, providing high gain over GPS/QZSS-L1/L2/L5, GLONASS-G1/G2/G3, Galileo-E1/E5a/E5b, BeiDou-B1/B2/B2a, and NavIC-L5, including the satellite-based augmentation system (SBAS) available in the region of operation [WAAS (North America), EGNOS (Europe), MSAS (Japan), or GAGAN (India)], as well as L-band correction services.

extended Filtering was added to the Tallysman TWA928L antenna to mitigate new radio frequency bands that interfere with GNSS signals. For example, new LTE bands have been activated, and their signal or harmonic frequencies can affect GNSS antennas and receivers. In North America, the planned Ligado service, which will broadcast in the frequency range of 1526 to 1536 MHz, can affect GNSS antennas that receive space-based L-band correction service signals (1539 - 1559 MHz). Similarly, new LTE signals in Europe [Band 32 (1452 - 1496 MHz)] and Japan [Bands 11 and 21 (1476 - 1511 MHz)] have also affected GNSS signals. Lastly, the Inmarsat satellite communication uplink (1626.5 - 1660.5 MHz), commonly used on maritime vessels, can also affect nearby GNSS antennas. Field tests have confirmed that Tallysman's custom XF filtering mitigates the new (Europe and Japan) and existing LTE signals, enabling the XF antenna to produce clean and pure GNSS radio frequency data.

Other key components are precision-tuned, twin circular dual-feed (Patented Accutenna® Technology), stacked patch elements. The signals from the two orthogonal feeds are combined in a hybrid combiner, amplified in a wideband LNA, then band-split for narrow filtering in each band and further amplified prior to recombination at the output. These features allow the TWA928LXF antenna to offer an excellent axial ratio, enabling multipath mitigation, leading to a very tight antenna phase centre.

Tallysman's TWA928LXF antenna is ideally suited for Real-Time Kinematic (RTK) and Precise Point Positioning (PPP) positioning, for autonomous vehicle navigation and guidance, and other applications where accuracy and precision matter.



Applications

- Autonomous vehicle navigation
- Precision GNSS positioning
- Mission-critical GNSS timing & synchronization
- RTK / PPP surveying systems
- Law enforcement and public safety

Features

- Integrated ground plane
- Low noise preamp (< 2.5 dB typ.)
- Axial ratio (< 2.0 dB typ.)
- Tight phase centre variation (PCV)
- High-gain LNA (30 dB typ.)
- Low current (36 mA typ.)
- ESD circuit protection (15 kV)
- Invariant performance from 2.5 to 16 VDC
- IP67, REACH, RoHS, and AEC compliant

Benefits

- Great multipath rejection
- Increased system accuracy
- Great 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

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+ L-Band correction services

Antenna			
Technology		Dual-feed Stacked RHCP ceramic patch	
		Gain	Axial Ratio
		dBic typ. at Zenith	dB at Zenith
GNSS			
GPS / QZSS	L1	4	<1.0
	L2	4	<1.0
	L5	-1.5	<1.5
GLONASS	G1	2.5	<1.5
	G2	2.5	<1.5
	G3	2.5	<1.5
Galileo	E1	4	<1.0
	E5A	-1.5	<1.5
	E5B	2.5	<1.5
	E6	-	-
BeiDou	B1	4	<1.0
	B2	2.5	<1.5
	B2a	-1.5	<1.5
	B3	-	-
IRNSS / NavIC	L5	-1.5	<1.5
QZSS	L6	-	-
L-Band Services (1525 MHz - 1559 MHz)		3.5	<1.0
Satellite Communications			
Iridium		-	-
Globalstar		-	-
Other			
Axial Ratio at 10°	-	Efficiency	-
PC Variation	± 10 mm		

Mechanicals	
Size	127 mm (dia.) x 19.4 mm (h.)
Weight	155 g (excluding cable)
Radome	EXL9330
Mount	3x 6M holes
Available Connectors	-

Environmental	
Operating Temperature	-40 °C to +125 °C
Storage Temperature	-50 °C to +125 °C
Vibration	MIL-STD-810-G - Test Method 514.6
Shock	MIL-STD-810-G - Test Method 516.6
Salt Fog	MIL-STD-810-G - Test Method 509.6
IP Rating	IP67
Compliance	IPC-A-610, FCC, RED / CE Mark, RoHS, REACH, AEC

Warranty:	
Parts and Labour	1-year standard warranty

Low Noise Amplifier (LNA) - Measured at 3V and 25°C

Frequency Bandwidth		Out of Band Rejection
Lower Band	1160 - 1255 MHz	≥ 90 dB @ ≤ 1050 MHz ≥ 95 dB @ ≤ 1125 MHz ≥ 90 dB @ ≥ 1350 MHz
L-Band - Correction Services	1539-1559 MHz	-
Upper Band	1559 - 1606 MHz	≥ 90 dB @ ≤ 1500 MHz ≥ 25 dB @ ≤ 1525 MHz ≥ 05 dB @ ≤ 1536 MHz ≥ 43 dB @ ≥ 1626 MHz ≥ 80 dB @ ≥ 1650 MHz

Architecture Pre-filter → LNA stage 1 → filter → LNA stage 2

Gain 30 dB typ. | 28 dB min.

Noise Figure 2.0 dB typ. (L2), 2.7 dB typ. (L1) @ 25 °C

VSWR < 1.5:1 typ. | 1.8:1 max.

Supply Voltage Range 2.5 to 16 VDC nominal, up to 50mV p-p ripple

Supply Current 36 mA typ. @ 25 °C

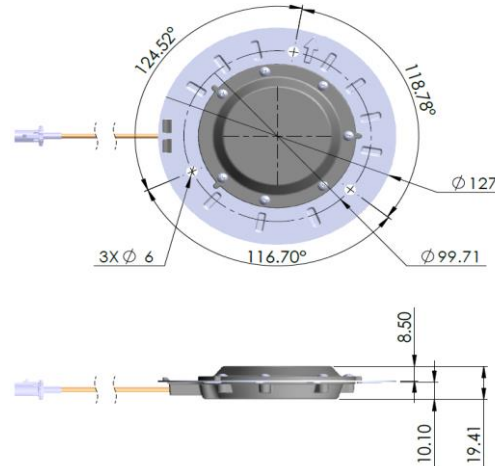
ESD Circuit Protection 15 kV air discharge

P 1dB Output 12 dBm typ.

Group Delay Upper GNSS Band : 12 ns
L5 Band : 29 ns
E5b Band : 20 ns
L2/G2 Bands : 6.0 ns

PCO ≈ 10 mm

Mechanical Diagram



Ordering Information

Part Number **33-A928LXF-xx-zzzz**

Where Cable type: RG316-DD; XX= connector Type; ZZZZ= cable length in mm

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