TW3972XF



TW3972XF Extended-Filter 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

The TW3972XF is a precision-tuned triple-band Accutenna® technology antenna providing coverage for triple-band GPS/QZSS-L1/L2/L5, GLONASS-G1/G2/G3, Galileo-E1/E5a/E5b, BeiDou-B1/B2/B2a, 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)], plus L-Band correction services. It is especially designed for precision triple-frequency positioning.

The radio frequency spectrum has become more congested as new LTE bands are activated and their signals or harmonic frequencies [e.g. $800 \, \text{MHz} \times 2 = 1600 \, \text{MHz} \times 2 = 16000 \, \text{MHz} \times 2 = 16000$

Ideal for train control sensors, autonomous vehicle tracking and guidance, precision agriculture, and other applications where precision matters, The TW3972XF provides superior multipath signal rejection, a linear phase response, and tight phase centre variation (PCV).

The TW3972XF features a precision-tuned, twin circular dual-feed, stacked patch element. 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. The antenna also has a strong pre-filter to mitigate inter-modulated signal interference from Ligado, LTE and other cellular bands. The TW3972XF offers excellent axial ratio and a tightly grouped phase centre variation.

The TW3972XF meets all requirements of the Association of American Railroads' Electronics Environmental Requirements and System Management Standard (S-9401.V1.0). In addition, it is also compliant with the EN45545-2, EN50121, EN50155, and EN61373 standards.

The TW3972XF is housed in a through-hole mount, weatherproof enclosure for permanent installations. L-bracket (PN 23-0040-0) or pipe mount (PN 23-0065-0) are available. A 100-mm ground plane is recommended for all installations. This antenna is also available in an OEM format: TW3967XF (28 dB) and TW3972EXF (37 dB).



Applications

- Autonomous vehicle tracking and guidance
- Positive Train Control (PTC)
- Positive Train Location (PTL)
- Precision GNSS position
- Precision agriculture
- Triple-frequency RTK and PPP receivers
- Safety & security

Features

- Very low noise preamp (< 2.5 dB typ.)
- Low axial ratio (< 2.0 dB typ.)
- Tight phase centre variation
- High-gain LNA (37 dB typ.)
- Low current (45 mA typ.)
- ESD circuit protection (15 kV)
- Invariant performance from 2.5 to 16 VDC
- IP69K, REACH, RoHS, and S-9401.V1.0 compliant
- EN45545-2, EN50121, EN50155, and EN61373 compliant

Benefits

- Excellent interference mitigation
- Excellent 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**

TW3972XF Extended-Filter 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

Antenna	
Technology	Dual-feed Stacked RHCP ceramic patch

		Gain	Axial Ratio	
		dBic typ. at Zenith	dB at Zenith	
GNSS				
	L1	4.0	< 1.0	
GPS / QZSS	L2	4.0	< 1.0	
	L5	-1.5	< 1.5	
	G1	2.5	< 1.5	
GLONASS	G2	2.5	< 1.5	
	G3	2.5	< 1.5	
	E1	4.0	< 1.0	
Caliloo	E5a	-1.5	< 1.5	
Galileo	E5b	2.5	< 1.5	
	E6	-	-	
BeiDou	B1	4.0	< 1.0	
	B2	2.5	< 1.5	
	B2a	-1.5	< 1.5	
	В3	-	-	
IRNSS / NavIC	L5	-1.5	< 1.5	
QZSS	L6	-	-	
L-band correction services		3.5	< 1.0	
Satellite Communications				
Iridium		-	-	
Globalstar		-	-	
Other				
Axial Ratio at 10°	-	Efficiency -		
Phase Centre Variation ±	: 10 mm			

M	PC	hani	ıca	ıς
			···	

Mechanical Size 66 mm (dia.) x 21 mm (h.)

[100 mm ground plane recommended]

Weight 185 g

Available Connectors see Ordering Guide

Radome / Enclosure Radome: EXL9330, Base: Zamak White Metal

Mount Through-hole

Environmental

Operating Temperature -70 °C to 85 °C Storage Temperature -70 °C to 95 °C

Mechanical Vibration MIL-STD-810D Method 514.4 and 514.5

Shock and DropMIL-STD-810G Method 516.6Salt FogMIL-STD-810F Method 509.4

Low Pressure - Altitude -

IP Rating (housing) IP69K

Compliance IPC-A-610, FCC, RED / CE Mark, RoHS, REACH, S-9401.V1.0, EN45545-2, EN50121, EN50155, EN61373

Warranty:

Parts and Labour 3-year standard warranty

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

Frequency Bandwith		Out-of-Band Rejection	
Lower Band	1160 - 1255 MHz	≥ 70 dB @ ≤ 1050 MHz ≥ 65 dB @ ≤ 1125 MHz ≥ 70 dB @ ≥ 1350 MHz	
L-band corrections services	1539 - 1559 MHz	≥ 65 dB @ ≤ 1500 MHz	
Upper Band	1559 - 1606 MHz	≥ 45 dB @ ≤ 1525 MHz ≥ 45 dB @ ≤ 1525 MHz ≥ 05 dB @ ≤ 1536 MHz ≥ 30 dB @ ≥ 1626 MHz ≥ 65 dB @ ≥ 1650 MHz	

Architecture Pre-filter \rightarrow LNA stage 1 \rightarrow filter \rightarrow LNA stage 2

 Gain
 37 dB typ. | 35 dB min.

 Noise Figure
 2.5 dB typ. @ 25 °C

 VSWR
 < 1.5:1 typ. | 1.8:1 max.</td>

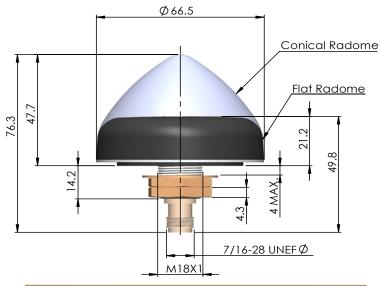
Supply Voltage Range 2.5 to 16 VDC nominal, up to 50mV p-p ripple

Supply Current45 mA typ. @ 25 °CESD Circuit Protection15 kV air dischargeP 1dB Output5.5 dBm typ.

Group Delay Variation 12 ns @ (L1+G1) | 7 ns @ (L5+L2+G2)

Group Delay

Mechanical Diagram



Ordering Information

Part Number 33-3972XF-xx-yy-zzzz

where xx = connector type, yy = shape and colour of radome, and 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/

© 2019 Tallysman Inc. All rights reserved. Tallysman, the "When Precision Matters" tag line and the Tallysman logo are trademarks or registered trademarks of Tallysman Inc. and/or its affiliates in Canada and certain other countries. All other trademarks mentioned in this document are the property of their respective owners. The information presented is subject to change without notice. Tallysman assumes no responsibility for any errors or omissions in this document. Tallysman Wireless Inc. hereby disclaims any or all warranties and liabilities of any kind.

www.tallysman.com