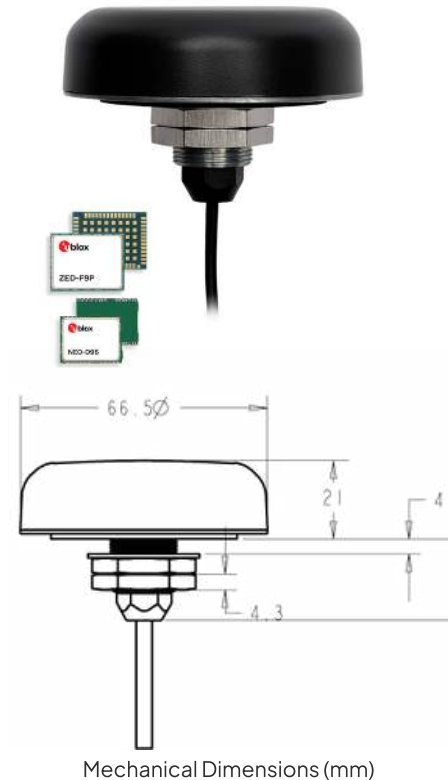# TW5394 Datasheet

CALIAN ®
Confidence. Engineered.

TW5394 Smart GNSS Antenna for Precise Positioning and Heading

Overview

The TW5394 is a multi-band (L1/L2), multi-constellation integrated GNSS receiver/antenna with integrated L-Band receiver for PointPerfect Flex PPP-RTK corrections. The TW5394 is capable of providing sub 1 meter accuracy stand alone, sub 6 cm accuracy with PPP-RTK corrections and sub 1 cm with RTK corrections to support the most demanding navigation, automation and precision mobility applications. Two TW5394's may be combined as a Moving Base RTK Precise Heading base and rover pair.

Interference Resilience

The TW5394 incorporates a latest generation multi-band (L1/L2) GNSS receiver with a Tallysman Accutenna® multi-band (L1/L2/LBand) triple band dual feed patch. The state of the art GNSS receiver supports concurrent tracking of all four major constellations (GPS, BeiDou, Galileo and GLONASS) in multiple frequency bands. The multi-band (L1/L2) architecture is highly effective method for the removal of ionospheric error. The TW5394 employs multi-stage filtering with low noise figure LNAs, combined with the dual feed Accutenna®, which greatly improves the rejection of multi-path signal interference.

Mechanical Dimensions (mm)

Precise Point Positioning

The TW5394 offers support for a broad range of corrections services (RTCM RTK, networked PPP-RTK or PointPerfect Flex PPP-RTK over L-Band) allowing performance optimization according to each application's unique requirements. The concurrent multi-band (L1/L2) access to all four satellite constellations improves the receiver's convergence capability to deliver a quick, precise and reliable position solution which is resilient to ionospheric errors and improves resilience against interference and jamming.

The TW5394 may also be configured to operate in an RTK mode as either a base or rover for sub cm precision. For Precise Heading applications, two TW5394's may be arranged as a moving base RTK base and rover pair. The base device may receive PPP-RTK corrections for increased positional accuracy while concurrently sending RTCM correction messages to the rover.

Features:

- Improved noise immunity with multi-band u-blox ZED F9P GNSS receiver
- PointPerfect Flex PPP-RTK (networked and L-Band)
- Improved multi-path rejection with Dual feed Accutenna®
- Multi-band GNSS receiver is resilient to ionospheric errors
- High reliability timing with expansive constellation array
- Moving base RTK Precise Heading base/rover pair
- Exceptional position performance standalone without correction services

- 5V operation
- RS-422 differential (or RS-232) signalling
- Industrial grade IP69K enclosure
- Rugged fixed mount
- Multiple cable lengths (5m, 15m and 25m)
- Available with conical radome

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Specifications

Antenna

Architecture . . . . Multi-band (L1/L2), Dual Feed
Axial Ratio. . . . . L1: < 1 dB typical.
Frequencies . . . . GPS L1C/A L2C, GLO L1OF L2OF, GAL E1B/C E5b, BDS B1I B2I, QZSS L1C/A L2C

SBAS L1 C/A . . . . WAAS, EGNOS, MSAS, GAGAN
Channels. . . . . 184-channel u-blox F9 engine
Anti-jamming . . . . Active CW detection
Corrections Receiver . . . . L-Band PPP-RTK (SSR)

Interface

Pwr, Gnd
33-5394-09-yy-zz. . . . . Data, Timepulse: RS-422 levels
33-5394-29-yy-zz. . . . . Data: RS-232; Timepulse: RS-422

Serial Protocol

Output . . . . NMEA 0183, UBX Binary, RTCM v3.3, SPARTN v2.0
Baud Rate . . . . Configurable
Update Rate . . . . 9 Hz (4); 10 Hz (GPS+GAL+BDS); 20 Hz (GPS+GAL); 20 Hz (GPS+GLO); 16 Hz (GP+BDS); 25 Hz (GPS)

Mechanical

Dimensions . . . . 66.5 mm dia. x 21 mm H
Weight . . . . 135 g
Mounting Method . . . . Industrial grade fixed Mount
Cable Length . . . . 5, 15, 25m with RJ45 termination

Electrical

Voltages . . . . 5 VDC
Current . . . . 0.6 Watts (nominal operating) Measured @ 5VDC supply

Environmental

Operating Temperature.. . . . . -40°C to +85°C
Storage Temperature. . . . . -40°C to +85°C
Weatherproof IP69K
Shock . . . . Vertical axis 50G,other axis 30G 3 axis sweep – 15 min

Vibration . . . . 10-200 Hz log sweep 3G

Sensitivity

Tracking & Nav . . . . -160 dBm
Reacquisition . . . . -160 dBm
Hot starts . . . . -158 dBm
Cold starts . . . . -147 dBm

Acquisition

Cold start . . . . 25 sec
Aided start . . . . 3 sec
Reacquisition . . . . 2 sec

Horizontal Posistion Accuracy (4 Constellations)

Standard PVT . . . . 1.5m CEP
Standard SBAS . . . . 1.0m CEP
Corrected RTK . . . . 0.01m + 1ppm CEP
Augmented SPARTN (PPP-RTK) . . . . <0.06m CEP
SPARTN Convergence . . . . <45 sec*

Heading

Dynamic Heading Accuracy . . . . 0.3° (30 m/sec)

Timing

Timing Accuracy . . . . 30 ns RMS

Ordering Information:

33-5394-09-yy-zz-PC0   (RJ45; Data and Timepulse: RS-422, PC0 = NMEA out, no adaptor cable.) (RJ45;
33-5394-29-yy-zz-PC0   Data: RS-232, Timepulse RS-422, PC0 = NMEA out, no adaptor cable.)

yy = Radome (00=grey conical, 10-grey low profile, 01-white conical, 11=white low profile)
zz = Cable length in meters. Standard is 5m. (15m and 25m are special order only)

33-5394-09-yy-zz-PC0 SDK Test Adaptor required for programming   **33-0095-11**
33-5394-29-yy-zz-PC0 SDK Test Adaptor required for programming   **33-0095-16**

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