TW1010/TW1012 Embedded GPS L1 Antenna

The TW1010/TW1012 by Tallysman Wireless is low cost, high gain, high performance, embedded GPS L1 antenna, specially designed for OEM industrial, military, precision positioning and timing applications.

The TW1010/TW1012 features a precisely tuned single feed ceramic patch element. It has a two stage Low Noise Amplifier (LNA) with a mid-section SAW. An optional tight pre-filter is available with part number TW1012 to protect against saturation by high level sub-harmonics and L-Band signals.

The TW1010/TW1012 covers the GPS L1 and SBAS (WAAS /EGNOS/MSAS) frequency band (1572.5 to 1578 MHz), and it offers great circular polarized signal reception, multipath rejection and out of band signal rejection.

The TW1010/TW1012 has a built-in 35mm circular ground plane that can be augmented with host system ground surfaces. Patch Elements are susceptible to detuning by the local environment. Tallysman offers custom services to assist with integration of OEM modules into an end user solution.

Applications
- High Accuracy & Mission Critical GPS
- Precision Agriculture, Mining & Construction
- Military & Security
- Avionics
- Law Enforcement & Public Safety
- Fleet Management & Asset Tracking

Features
- Very low noise LNA: 1 dB (TW1010).
- Great axial ratio: <4dB at Zenith
- High rejection SAW filter
- LNA gain: 28 dB typ (TW1010).
- Low current: 10 mA typ.
- ESD circuit protection: 15 KV
- Wide Supply voltage: fixed 2.5V to 16V

Benefits
- Low Profile: 7.25mm
- Great multipath rejection
- Increase system accuracy
- Excellent signal to noise ratio
- Great out of band signal rejection
- Compact form factor
- RoHS compliant
### TW1010/TW1012 Embedded GPS L1 Antenna Specifications

At: \( Vcc = 3V \), over full bandwidth, \( T=25°C \)

#### Antenna
- **Architecture**: Custom single-feed ceramic patch
- **Polarization**: RHCP
- **Antenna Gain (70mm ground plane)**: 4 dBi at 90°, 4 dB at 90°, 6 dB at 20°
- **Axial Ratio**: 1575.42MHz +/- 10MHz

#### Electrical
- **Architecture**
  - TW1010: LNA stage 1 -> SAW filter -> LNA stage 2
  - TW1012: SAW Prefilter -> LNA stage 1 -> SAW filter -> LNA stage 2
- **Gain (1575.42 to 1606 MHz)**
  - TW1010: >27dB min.
  - TW1012: >25dB min.
- **Filtered LNA Frequency Bandwidth (3dB)**: 1575.42MHz +/- 10MHz
- **Out-of-Band Rejection**
  - TW1010: <1500MHz >35dB.
  - TW1012: >70dB.
  - TW1010: >1550MHz >25dB.
  - TW1012: >45dB.
  - TW1010: >1650MHz >35dB.
  - TW1012: >70dB.
- **VSWR at LNA output**: <1.5:1
- **Noise Figure**
  - TW1010: 1 dB typ.
  - TW1012: 3.5dB typ.
- **Supply Voltage Range (over coaxial cable)**: +2.5VDC to 16VDC nominal
- **Supply Current**
  - 10mA typ. @ 85°C
- **ESD Circuit protection**
  - 15KV air discharge

#### Mechanicals & Environmental
- **Mechanical Size**: 35mm dia. x 7.5mm
- **Connectors**: Optional
- **Cable**: 1.48mm OD, 15 cm. Custom lengths optional
- **Operating Temp. Range**: -40°C to +85°C
- **Weight**: 30 g
- **Attachment Method**: Adhesive or screw mount
- **Environmental**: RoHS compliant
- **Shock**: Vertical axis: 50G, other axes: 30G
- **Vibration**: 3 axis, sweep = 15 min, 10 to 200 Hz sweep: 3G
- **Warranty**: One year – parts and labour

#### Ordering Information
- TW1010 – GPS L1 antenna, 32-1010-XX – YYYY - ZZ
- TW1012 – Pre-filtered OEM GPS L1 antenna, 32-1012-XX – YYYY - ZZ

Please contact Tallysman Wireless for additional information.

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