

# Mini-T™ GG Multi-GNSS Disciplined Clock

## Multi-GNSS Disciplined Clock

Protempis Mini-T™ GG is a multi-GNSS (GPS, GLONASS) Disciplined Clock, optimized to generate precise timing signal. Designed specifically for compact, high-volume applications. When operating in Over Determined Timing Mode the accuracy of pulse per second (PPS) is within 15 nanoseconds of GNSS/UTC.

## Synchronization for Next Generation

The Mini-T™ GG gives OEMs the opportunity to embed a low-cost precise time and frequency reference, in our smallest form-factor yet.

Protempis created the Mini-T™ GG using clock technology proven in generations of deployed units used in 4G networks (LTE, WiMAX, HSPA+) and digital broadcasting applications. It utilizes the latest in GNSS technology, combined with a precision ovenized oscillator for near atomic clock precision timing.

## Standard Timing Feature

Protempis Mini-T™ GG is a multi-GNSS (GPS, GLONASS) Disciplined Clock, optimized to generate precise timing signal. Designed specifically

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## Synchronization for Next Generation

The Mini-T™ GG includes many of Protempis's standard timing features, including the Disciplined Clock Autonomous Integrity Monitoring (T-RAIM) algorithm, and automatic self-survey. The Mini-T™ GG is factory default with the TSIP protocol that follows specific timing products and applications.

## Proven Reliability

The Mini-T™ GG offers proven reliability and performance, will exceed your expectations, and enable you to provide your customers with the highest quality GNSS solution available today. The Mini-T™ GG GNSS Clock Board is offered with a standard 10 MHz output, but it is also available in custom frequencies.



## Key Features

- Multi-Constellation
- Simultaneous GPS and GLONASS tracking
- Extended temperature range (-40°C / +85°C)
- Holdover stability of ±5us over 24 hour period @ 25°C
- Small foot print and low profile, suited for digital broadcast and small cells
- PPS and 10MHz output
- T-RAIM (Disciplined Clock Autonomous Integrity Monitoring) provides high PPS integrity

### Disclaimer

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## General Specifications

Receiving Signal.....GPS L1 & GLONASS G1  
 Positioning System.....SPS, Timing  
 Acquisition Channels..... 24 Channels  
 Tracking Channels..... 24 Channels  
 1 PPS Timing Accuracy ..... 15 ns (1 sigma)  
 Holdover Stability.....<math>\pm 5\mu s</math> over 24Hr period @ 25°C  
 Horizontal Position Accuracy.....<math>< 6m</math> (50%), <math>< 9m</math> (90%)  
 Vertical Position Accuracy.....<math>< 11m</math> (50%), <math>< 18m</math> (90%)  
 Update Rate.....1 Hz  
 Data Format.....TSIP or NMEA  
 Typical Min Acq Sensitivity.....-150dBm cold start  
 Typical Min Tracking Sensitivity .....-160dBm  
 Time to First Fix.....<math>< 46s</math> (50%), <math>< 50s</math> (90%) cold start  
 Typical Time to Re-acquisition.....<math>< 2s</math> (90%)

## Interface Characteristics

Serial Port.....1 serial port  
 PPS / Even Second.....CMOS-compatible  
 TTL-level pulse, once per second  
 Protocols.....TSIP, NMEA 0183  
 GNSS Input Connector.....SMA  
 PPS Out.....SMA  
 Frequency Out.....SMA  
 I/O Connector.....2x15 Pin

## Oscillator Specifications

Frequency Output.....10MHz  
 Phase Noise.....-90dBc/Hz @ 1Hz  
 -120dBc/Hz @ 10Hz  
 -135dBc/Hz @ 100Hz  
 -145dBc/Hz @ >1KHz

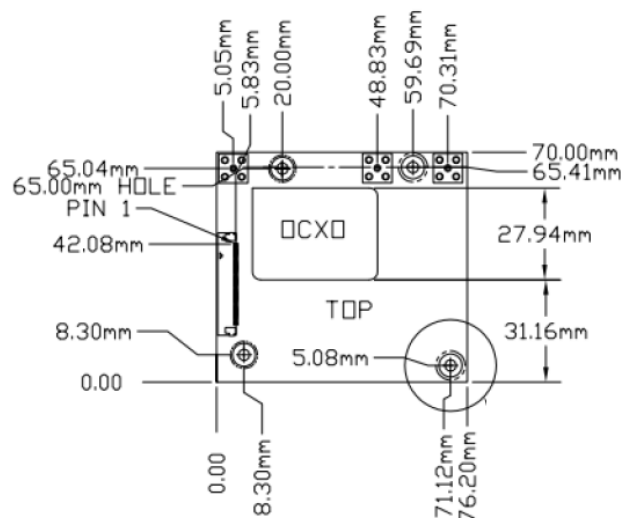
## Electrical Characteristics

Supply Voltage Range.....5.5V DC  $\pm 5\%$

## Environmental Characteristics

Operating Temperature.....-40°C to +85°C  
 Vibration 0 008 g<sup>2</sup>/Hz.....5 Hz to 20 Hz  
 0 05 g<sup>2</sup>/Hz.....20 Hz to 100 Hz  
 -3 dB/octave.....100 Hz to 900 Hz  
 Operating Humidity.....5%-95%  
 RH non-condensing (+60°C)

## Mechanical Drawing



## General Information

Bullet GG, 5V DC with 32 dB gain

Please go to [www.protempis.com](http://www.protempis.com) for the latest documentation and tools, part numbers and ordering information.

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