

CSAC GPSDO (Chip Scale Atomic Clock) Frequency Standard



- **2.5 X 3.0 X 0.7 Inches**
- **Cesium Vapor based Atomic Clock**
- **Stationary or Mobile GPS mode**
- **Less than 1W Power Consumption**
- **Ultra Fast <2 minute warm-up**
- **PRELIMINARY SPECIFICATION**

TYPICAL ELECTRICAL SPECIFICATIONS:

| Module Specification: | | |
|--|--|------------|
| Long-Term Oscillator Aging (without GPS - Zero aging with GPS) | Less than 0.3ppb per month in Holdover without GPS | |
| Frequency Stability Over Temperature | Better than $\pm 0.5E-09$ (CSAC only, no GPS Disciplining, 0°C to +75°C) | |
| 1 PPS Accuracy | $\pm 15ns$ to UTC RMS (1-Sigma) GPS Locked in Position Hold mode | |
| Frequency Accuracy | Better than $\pm 2E-010$ after 3 minutes operation with GPS lock | |
| Holdover Stability | $< \pm 2us$ over 24 Hour Period @+25°C (after 20 minutes with GPS lock) | |
| ADEV (with GPS lock) | 1s: $< 1E-10$, 10s: $< 2.5E-11$, 100s $< 2E-11$, 1Ks: $< 1E-11$, 10Ks: $< 2E-12$ | |
| 1 PPS Output (CSAC Flywheel Generated) | 5V CMOS output, can be shifted in 1ns steps relative to UTC | |
| 10MHz Output, 5MHz Output | Four Isolated 10MHz Sine Wave $\pm 13dBm$ $\pm 3dBm$, one 5MHz CMOS 5V | |
| Distribution Amplifier Port Isolation | 2MHz: $> 98dB$, 10MHz: $> 85dB$ | |
| RS-232 Control (Including USB Port) | Full SCPI-99 Control Commands at 9.6K, 19.2K, 38.4K, 57.6K, 115.2K | |
| RS-232 NMEA Output Sentences | NMEA 0183 rev. 2.3, Sentences: GGA, RMC, ZDA, PASHR, and others | |
| GPS Frequency, Antenna | L1 C/A 1574MHz, Passive or Active Antenna 5V, MMCX Connector | |
| GPS Receiver | 50 Channels, Mobile, SBAS: WAAS, EGNOS, MSAS supported | |
| Sensitivity | Acquisition -144 dBm, Tracking -160 dBm | |
| GPS TTFF | Cold Start - < 45 sec, Warm Start - 1 sec, Hot Start - 1 sec | |
| GPS Receiver Motion Adaptive Filter Settings | Optimized depending on vehicle velocity (Auto-sensing, Auto-switching) | |
| TTL Alarm Output | GPS Unlock and Hardware Failure indicator | |
| Warm Up Time / Stabilization Time Without GPS | < 2 min at +25°C to $< 5E-010$ Accuracy Typ. | |
| Supply Voltage (Vdd) | Aircraft and Vehicle Power Range: 8V to 36VDC, or 5V via Mini-USB | |
| Power Consumption | $< 1W$ at +25°C with CMOS output option at 12V Vdd | |
| Operating Temperature | 0°C to +75°C (-40C to +85C extended temp range option) | |
| g-sensitivity | $< 0.2ppb$ per-g per-axis | |
| Magnetic Sensitivity | Less than 0.4ppb per Gauss | |
| Storage Temperature | -45°C to +100°C | |
| MTBF | $> 100,000$ Hours (0°C to +75°C) | |
| USB, LCD support | Optionally USB powered and controlled, supports 16x2 LCD Displays | |
| Ordering Options | Extended Temp Range option, Remove Phase-Noise-Filter option, CMOS 10MHz output option, 5.0V Power Supply option | |
| Phase Noise | 10Hz | -90dBc/Hz |
| | 100Hz | -125dBc/Hz |
| | 1KHz | -145dBc/Hz |
| | 10kHz | -152dBc/Hz |
| | 100kHz | -153dBc/Hz |

Chip Scale Atomic Clock GPSDO:

MADE IN USA



Jackson Labs Technologies, Inc, 475 Alberto Way, Suite 120, Los Gatos, CA 95032
 Phone: (408) 354-7888, Fax: (408) 354-7880, www.jackson-labs.com
sales@jackson-labs.com