

HD CSAC GPSDO (Chip Scale Atomic Clock) Time and Frequency Standard



"the next generation in frequency and timing"

- 2.0 X 2.5 X 0.7 Inches
- Cesium Vapor based Atomic Clock
- 1.2W 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 +70°C)	
1 PPS Accuracy	$\pm 15ns$ to UTC RMS (1-Sigma) GPS Locked in Position Hold mode	
Frequency Accuracy	Better than $\pm 2E-10$ after 3 minutes operation with GPS lock	
Holdover Drift (after 5 minute warmup with GPS lock)	$< \pm 2.5us$ drift per hour over worst case temperature range	
Typical Holdover Drift (after 5 minute warmup with GPS lock)	$< \pm 1us$ drift per hour at 25°C $\pm 5^\circ C$	
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)	LVDS output, can be shifted in 1ns steps relative to UTC	
10MHz Outputs	10MHz LVDS, 10MHz CMOS 5V	
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	
External GPS option	1PPS input for optional external SAASM GPS receiver	
GPS Frequency, Antenna	L1 C/A 1574MHz, Passive or Active Antenna 3.3V, MMCX Connector	
GPS Receiver	50 Channels, Mobile, SBAS: WAAS, EGNOS, MSAS supported	
Sensitivity	Acquisition -147 dBm, Tracking -160 dBm	
GPS Time To First Fix	Cold Start - <30 sec, Warm Start - 1 sec, Hot Start - 1 sec	
GPS Receiver Motion Adaptive Filter Settings (dynamic mode enabled)	Optimized depending on vehicle velocity (Auto-sensing, Auto-switching)	
TTL Alarm Output	Hardware Event Indicator	
Warm Up Time / Stabilization Time Without GPS	<180s at +25°C to $< 5E-010$ Accuracy Typ.	
Supply Voltage (Vdd)	+12V $\pm 5\%$	
Power Consumption	<1.25W at +25°C	
Operating Temperature	-10C to +70C	
g-sensitivity	<0.2ppb per-g per-axis	
Magnetic Sensitivity	Less than 0.4ppb per Gauss	
Storage Temperature	-45°C to +85°C	
MTBF	> 100,000 Hours	
Connectors	Compatible to FireFly-IIA connector	
Phase Noise	10Hz	-75dBc/Hz
	100Hz	-115dBc/Hz
	1KHz	-128dBc/Hz
	10kHz	-134dBc/Hz
	100kHz	-140dBc/Hz

HD CSAC GPSDO, PN: 1005111

MADE IN USA



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