

CSAC GPSDO (Chip Scale Atomic Clock) Frequency Standard



"the next generation in frequency and timing"

- 2.5 X 3.0 X 0.7 Inches
- Cesium Vapor based Atomic Clock
- Stationary or Mobile GPS mode
- Less than 1.4W 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 $\pm 2E-010$ after 3 minutes operation with GPS lock	
Holdover Stability (after 96 hours warmup)	$< \pm 2us$ 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 +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	< 3 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	$< 1W$ with CMOS output option (12V Vdd) $< 1.4W$	
Operating Temperature	-10°C to +70°C	
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 (0°C to +70°C)	
USB, LCD support	Optionally USB powered and controlled, supports 16x2 LCD Displays	
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



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