HD CSAC

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

Defense | 5G Communications | SATCOM | Transportation
Data Center Energy | Financial | Critical Infrastructure

The HD CSAC (Chip Scale Atomic Clock) GPSDO platform optimizes size, weight, and power (SWAP) by removing some of the generic features of the CSAC GPSDO. The HD CSAC operates from a +12 V power supply to support mobile applications such as man-pack, airborne, and vehicle applications.

The HD CSAC GPSDO supports a mobile-mode GPS receiver with 50 channels and SBAS (WAAS/EGNOS/MSAS) support, and better than -160 dBm tracking capability. The HD CSAC supports industry-standard NMEA output sentences, SCPI control, and command interfaces.

Highlights

- Designed for mobile applications such as man-pack, airborne, and vehicle applications
- Cesium Vapor Chip Scale Atomic Clock (CSAC) for holdover, and <2 minute warmup
- RS-232 serial port for command and control
- CMOS and LVDS 10 MHz outputs, 1 PPS LVDS output
- Very small form factor 2" x 2.5" x 0.7"
- 1.2 W Power Consumption
- Ultra-Fast Warmup
- Functionally compatible with the FireFly-II board

HD CSAC

Typical Electrical Specifications

Module Specifications	Description
Long-Term Oscillator Aging	Less than 0.3 ppb per month in holdover without GPS
	Zero aging with GPS
Frequency Stability Over Temperature	Better than ±0.5E-09 (CSAC only, no GPS Disciplining, 0°C to +70°C)
1 PPS Accuracy	±15 ns to UTC RMS (1-Sigma) GPS Locked in Position Hold mode
Frequency Accuracy	Better than ±2E-010 after 3 minutes operation with GPS lock
Holdover Drift (after 5-minute warmup with GPS lock)	<±2.5 µs drift per hour over worst case temperature range
Typical Holdover Drift (after 5-minute warmup with GPS lock)	<±1 µs drift per hour at 25°C ±5°C
ADEV (with GPS lock)	
1 s	<1E-10
10 s	<2.5E-11
100 s	<2E-11
1K s	<1E-11
10K s	<2E-12
1 PPS Output (CSAC Flywheel Generated)	LVDS output, can be shifted in 1 ns steps relative to UTC
10 MHz Outputs	10 MHz LVDS, 10 MHz CMOS 5 V
RS-232 Control (Including USB Port)	Full SCPI-99 Control Commands at 9.6 K, 19.2 K, 38.4 K, 57.6 K, 115.2 K
RS-232 NMEA Output Sentences	NMEA 0183 rev. 2.3, Sentences: GGA, RMC, ZDA, PASHR, and others
External GPS option	1 PPS input for optional external SAASM GPS receiver
GPS Frequency, Antenna	L1 C/A 1574 MHz, Passive or Active Antenna 3.3 V, 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

Typical Electrical Specifications continued

Module Specifications	Description	
Warm Up Time/Stabilization Time Without GPS	<180 s at +25°C to <5E-010 accuracy typical	
Supply Voltage (Vdd)	+12 V ±5%	
Power Consumption	<1.25 W at +25°C	
Temperature		
Operating Temperature	–10°C to +70°C	
Storage Temperature	–45°C to +85°C	
g-sensitivity	<0.2 ppb per-g per-axis	
Magnetic Sensitivity	Less than 0.4 ppb per Gauss	
MTBF	>100,000 Hours	
Connectors	Compatible to FireFly-IIA connector	
Phase Noise	10 Hz	–75 dBc/Hz
	100 Hz	–115 dBc/Hz
	1 kHz	–128 dBc/Hz
	10 kHz	–134 dBc/Hz
	100 kHz	–140 dBc/Hz

NOTE: Specifications subject to change without notice.

Product Ordering Information

Product Number	Description
1005111	CSAC HD 10MHz Ext Temp OEM Board - non-RoHS

VIAVI

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