

# SAASM HD CSAC Disciplined Atomic Frequency Standard



- 2.0 X 2.85 X 0.6 Inches
- Cesium Vapor based Atomic Clock
- SAASM with L1/L2 GPS reception
- Less than 1.1W Total Power
- Cold-Zerorize with backup battery
- 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 stability to UTC	$\pm 25ns$ to UTC RMS (1-Sigma) GPS Locked with P(Y) Code stationary	
Frequency Accuracy	Better than $\pm 2E-010$ after 3 minutes operation with GPS lock	
Holdover Stability (7 days on with GPS, then 24 hours off cold-soak)	$< \pm 2\mu s$ over 24 Hour Period @ +25°C (after 3hrs 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	
10MHz Output	One 5V CMOS 10MHz, one LVDS differential 10MHz output	
SAASM Software Key-Zerorize	Via RS-232 SCPI interface command	
SAASM Hardware Cold Key-Zerorize (no prime-power required)	External switch and 2V to 5V small backup battery, 3.6V nominal	
RS-232 Control	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, GSV	
GPS Frequency, Antenna	L2 P(Y), L1 C/A and P(Y), Active Antenna 3.3V, MMCX Connector	
GPS Receiver (Rockwell SAASM MicroGram)	12 Channels, Mobile, SAASM with DS101 Key and Zerorize	
GPS Receiver Footprint	SMT module	
GPS TTFF (DS101 Keyed, fresh Almanac auto-saved in NVRAM)	Cold Start - $< 110$ sec, Warm Start - $< 90$ sec, Hot Start - $< 10$ sec	
GPS Dynamics	9g operating, 600g shock	
TTL Alarm Output	GPS Unlock, Event, and Hardware Failure indicator	
Warm Up Time / Stabilization Time Without GPS	$< 3$ min at +25°C to $< 5E-010$ Accuracy Typ.	
Supply Voltage (Vdd)	10V to 15VDC (12V nominal)	
Power Consumption	$< 1.1W$ at +25°C at 12V Vdd, tracking GPS	
Operating Temperature	-10°C to +70°C	
g-sensitivity	$< 0.1ppb$ per-g per-axis	
Magnetic Sensitivity	Less than 0.4ppb per Gauss	
Storage Temperature	-40°C to +85°C	
MTBF	$> 25,000$ Hours (0°C to +70°C)	
Ordering Options	DS-101 Key Connector on side or on front of PCB, External DAGR Cold-Start Assist via ICD-153 interface	
Phase Noise	10Hz	$< -75dBc/Hz$
	100Hz	$< -115dBc/Hz$
	1KHz	$< -130dBc/Hz$
	10KHz	$< -140dBc/Hz$
	100kHz	$< -140dBc/Hz$

## SAASM HD CSAC Chip Scale Atomic Clock GPSDO: MADE IN USA



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