Preliminary Product Brief

VIAVI

µPNT[™] C-Force[™] GNSS-Integrated Clock Part# 100801

Ultra-high stability, ultra-low phase noise oscillator for high vibration, high-temperature and demanding air/ground/sea environments Defense | Airborne | All-Terrain Vehicles | Maritime | Drone | UAV Counter IED/Counter UAS | Communications| Radar

Solving Defense Operational Challenges

PNT equipment designed for all-domain defense applications must operate reliably in challenging environments, enduring intense vibration, severe shock, and extreme temperature

Under such demanding conditions, integrated modules must be ruggedized and maintain optimal performance, ensuring reliable timing and operation even when GNSS signals are compromised.

Highly Ruggedized PNT Clock Solution

The new µPNT[™] C-Force[™] GNSS-Integrated Clock is a highly ruggedized GNSS receiver and oscillator module designed for low SWaP (size, weight and power) applications.

It features various I/O signals, and its innovative operating capabilities ensure reliable performance across a wide range of demanding air, ground and sea environments, from military applications to harsh industrial conditions.



Benefits

- Ruggedized GNSS+oscillator clock module
- Innovative operating capabilities
- Suitable for low SWaP PNT applications
- High performance in GNSS-denied environments
- Cost-effective design solution

Features

- Ultra-high stability: <10ns rms (1-Sigma) to UTC in GNSS-locked mode
- Ultra-low 10 MHz phase noise: -95 dBc/Hz at 1 Hz under airborne vibration
- Frequency Stability over Temperature, per-g per axis ±3E-09, <0.08 ppb per g
- Integrated L1/L2 GNSS receiver
- High temperature range: -55°C to +95°C
- Holdover: 5 µs over 6 hours

Typical Specifications

GNSS L1 and L2, Auto-Survey, Position-Hold Mode, SSM Notch Filters GNSS Frequency, antenna power L1 and L2, GPS/Glonass/Galileo/Bei/Dou/QZSS 3.3V power out Acquisition -148 dBm, Tracking -167 dBm GNSS TFF (one hour on with GNSS, then one hour off for cold-start) Cold Start <29 sec, Warm Start <2 sec, Hot Start <2 sec TPPS Output OCX 01/wheel generated, LVDS Levels 1 1PPS Output OCX 01/wheel generated, LVDS Levels 2 ADEV at 25.0°C, no airflow, no motion/vibration, 5 dots or e 6 hours 2 GPS locked 0.1s < 4E-12, 1s < 3E-12, 1Ks < 6E-12, 10Ks < 2E-12 Holdover at 25.0°C, no airflow, no motion/vibration, 5 5 dys GPS locked 1PPS Guput 0.1s < 4E-12, 1s < 3E-12, 1Ks < 6E-12, 10Ks < 2E-12 1PPS Input 1 4 5 1PPS Locked Supports an optional external 1PPS TTL/CMOS input Frequency Outputs - - 1PPS External Reference Supports an optional external 1PPS TTL/CMOS input Frequency Stabilization Time - 8.5 dBm a0.5 dB Warmup and Stabilization Time - 8.5 dBm a0.5 dB Phase Noise @ 10Mhz under airborne vibration -	µPNT™ C-Force™ GNSS-Integrated Clock	
GNSS Frequency, antenna power L1 and L2, OPS/Glonass/GallieOBe/low/2SS 3.3V power out Sensitivity Acquisition -148 dBm, Tracking -167 dBm GNSS TTFF (one hour on with GNSS, then one hour off for cold-start) Cold Start <29 sec, Warm Start <2 sec, Hot Start <2 sec TPPS Output OCXO flywheel generated, LVDS Levels 1 1PPS Stability <10ms to UTC RMS (1-Signa) GPS Locked 0 ADEV at 25.0°C, no airflow, no motion/vibration, 5 <5us over 6 hours 5us over 6 hours 1PPS Stability <10ms to UTC RMS (1-Signa) GPS Locked 1PPS Iob/cked 5us over 6 hours 5us over 6 hours 1PPS stability <4E-12, 1s < 3E-12, 1Ks < 6E-12, 10Ks <2E-12 1PPS Ioput 5us over 6 hours 1PPS staput 5us over 6 hours 1PPS staput 1 1PPS ioput 1 1PPS ioput 1 1 <td< th=""><th></th><th></th></td<>		
Sensitivity Acquisition -148 dBm, Tracking -167 dBm GNSS TTFF (one hour on with GNSS, then one hour off for Cold Start <29 sec, Warm Start <2 sec, Hot Start <2 sec	GNSS Receiver	L1 and L2, Auto-Survey, Position-Hold Mode, SSM Notch Filters
Sensitivity Acquisition -148 dBm, Tracking -167 dBm GNSS TTFF (one hour on with GNSS, then one hour off for cold Start <29 sec, Warm Start <2 sec, Hot Start <2 sec, Odd Start <29 sec, Warm Start <2 sec, Hot Start <2 sec,	GNSS Frequency, antenna power	L1 and L2, GPS/Glonass/Galileo/BeiDou/QZSS 3.3V power out
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cold-start) IPPS Output 1PPS Output OCXO flywheel generated, LVDS Levels 1PPS Stability <10ns to UTC RNK (1-Sigma) GPS Locked	GNSS TTFF (one hour on with GNSS, then one hour off for	Cold Start <29 sec, Warm Start <2 sec, Hot Start <2 sec
1PPS Output OCXO flywheel generated, LVDS Levels 1PPS Stability <10ns to UTC RMS (1-Sigma) GPS Locked		
1 PPS Stability <10ns to UTC RMS (1-Sigma) GPS Locked	1PPS Output	
1 PPS Stability <10ns to UTC RMS (1-Sigma) GPS Locked	1PPS Output	OCXO flywheel generated, LVDS Levels
GPS locked Holdover at 25.0°C, no airflow, no motion/vibration, 5 days GPS locked 1PPS Input 1PPS Input Supports an optional external 1PPS TTL/CMOS input Frequency Outputs 10 MHz +8.5dBm ±0.5dB Warmup and Stabilization Time <8 min at +25°C to <1E-09 Accuracy to GNSS	1 PPS Stability	<10ns to UTC RMS (1-Sigma) GPS Locked
days GPS locked IPPS Input 1PPS External Reference Supports an optional external 1PPS TTL/CMOS input Frequency Outputs +8.5dBm ±0.5dB 10 MHz +8.5dBm ±0.5dB Warmup and Stabilization Time <8 min at +25°C to <1E-09 Accuracy to GNSS	GPS locked	0.1s < 4E-12, 1s < 3E-12, 1Ks < 6E-12, 10Ks < 2E-12
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38.4Mhz optional output +8.5dBm ±0.5dB Phase Noise @ 10Mhz under airborne vibration		<8 min at +25°C to <1E-09 Accuracy to GNSS
Phase Noise @ 10Mhz under airborne vibration Image: space spac	1	
10 MHz Retrace <±1E-09 After 1 Hour @ +25°C (no GNSS)	Phase Noise @ 10Mhz under airborne vibration	10Hz -118dBc/Hz 100Hz -134dBc/Hz 1kHz -142dBc/Hz 10kHz -152dBc/Hz
Output Harmonics, spurs <-50dBc/Hz, <-70dBc/Hz	Frequency Stability over Temperature, per-g per axis	±3E-09, <0.08ppb per g
OCXO aging (fully compensated by GNSS) <±0.1ppm per year without GNSS	10 MHz Retrace	<±1E-09 After 1 Hour @ +25°C (no GNSS)
Communications Serial Control GNSS NMEA and Status Output, SCPI-99 control, RS-422 Port Power & Consumption 5.5V + 0.5V/-0.3 Supply Voltage (Vdd) 5.5V + 0.5V/-0.3 Power consumption <1.75W @25C, <2W during warmup	Output Harmonics, spurs	<-50dBc/Hz, <-70dBc/Hz
Serial Control GNSS NMEA and Status Output, SCPI-99 control, RS-422 Port Power & Consumption 5.5V + 0.5V/-0.3 Supply Voltage (Vdd) 5.5V + 0.5V/-0.3 Power consumption <1.75W @25C, <2W during warmup	OCXO aging (fully compensated by GNSS)	<±0.1ppm per year without GNSS
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Power consumption <1.75W @25C, <2W during warmup		
Environmental Temperature range Operating Storage -55°C ambient to +95°C case temperature -55°C ambient to +95°C case temperature Mechanical -55°C ambient to +95°C case temperature Size 1.5 x 3.0 x 0.7 Inches Weight <4 oz	Supply Voltage (Vdd)	
Temperature range Operating Storage -55°C ambient to +95°C case temperature -55°C ambient to +95°C case temperature Mechanical I.5 x 3.0 x 0.7 Inches Size 1.5 x 3.0 x 0.7 Inches Weight < 4 oz Connections SMA 10MHz Sine Wave Out, GNSS Antenna SMA +5.5V Power, 1PPS output, RS-422 serial 12-pin Hirose, PN: DF11-12DP-2DSA(01)	•	<1.75W @25C, <2W during warmup
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+5.5V Power, 1PPS output, RS-422 serial 12-pin Hirose, PN: DF11-12DP-2DSA(01)		
	10MHz Sine Wave Out, GNSS Antenna	SMA
3-pin 100mil through hole (optional) 1PPS Input ISP#		12-pin Hirose, PN: DF11-12DP-2DSA(01)
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