



TURbo Series

- TIMING UNIT RUBIDIUM OSCILLATOR (TURbo)
- COMPACT, HIGH PERFORMING, VERY LOW DRIFT, LOW PHASE NOISE
- EXCELLENT SHORT, LONG-TERM STABILITY
- LOW FREQUENCY CHANGE OVER TEMPERATURE

APPLICATIONS

- U.S. Department of Defense and Agencies
- Dynamic tactical or stationary environments, including ground mobile vehicles, surface ships, fixed-wing aircraft and stationary sites
- Disciplined clock in GPS-based assured position, navigation and timing (A-PNT) References
- Signals intelligence (SIGINT) systems requiring compliance to JASA v3 Annex 1: time, frequency, navigation and geodesy (TFNG)(U)
- Long-term holdover clock for continued operation when GPS and external disciplining references are denied or degraded
- Reference oscillator for radar, software-defined radios (SDR), guidance systems, and secure communications systems

FEATURES

- Low Drift (Aging): 1.0E-12/Day, 1.0E-11/Month and 1.0E-10/Year
- Excellent Short Term Stability (ADEV)
- Low Phase Noise at Full Range of Offsets
- Excellent Retrace Characteristics
- Digital Tuning (Serial Communication Protocol): Adjustment Range ($\pm 1.0E-6$), Resolution (1.0E-15)
- Excellent Frequency Stability Over Full Operating Temperature Range (-40°C to +60°C)
- High Reliability: MTBF > 200,000 Hours
- 1PPS Input for Direct Disciplining from a Known-Good External Reference Source
- Single Power Supply Operation: 15 ± 0.25 Vdc

AVAILABLE CONFIGURATION OPTIONS

- Output Frequencies from 10 to 60 MHz Available

SPECIFICATIONS

PARAMETER		UNIT
Output Frequency (Square Wave)	10.0	MHz
Amplitude Into 50 ohms	$\geq +8$	dBm
Drift (Aging + Long Term Stability)	$\leq 1.0E-12$	/Day
	$\leq 1.0E-11$	/Month
	$\leq 1.0E-10$	/Year
Short Term Stability (ADEV)		
T = 1	$\leq 7.0E-12$	
T = 10	$\leq 2.2E-12$	
T = 100	$\leq 7.0E-13$	
T = 1000	$\leq 2.2E-13$	
Phase Noise @ 10 MHz:		
@ 1 Hz offset	≤ -85	dBc/Hz
@ 10 Hz offset	≤ -110	dBc/Hz
@ 100 Hz offset	≤ -130	dBc/Hz
@ 1 kHz offset	≤ -140	dBc/Hz
@ 10 kHz offset	≤ -145	dBc/Hz
Alignment 1 PPS out vs 1 PPS in	1	nS
Retrace (On 24hrs-Off 48hrs-On)	$\leq \pm 2.0E-11$	
Digital Adjustment Range	$\pm 1.0E-6$	
Digital Adjust. Resolution	1.0E-15	
Operating Temperature (at	-40 to +60	°C
Storage Temperature Range	-40 to +80	°C
Frequency Stability vs. Temperature		
-40 °C to +60 °C	$< 1.0E-10$	
Warm-up Time to 1.0E-10 @ 25 °C	≤ 10	min
Input Power (15 Vdc Option):	15 ± 0.25	Vdc
- Power (Maximum @ -40 °C)	35	W
- Power (Steady State @ 25 °C)	15	W
Frequency Stability vs. Input Voltage	$\leq 5.0E-12$	/V
Magnetic Field (≤ 5 Gauss DC)	$\leq 2.0E-11$	/Gauss
Dimensions: (L x W x H)	3.25 x 2.8 x 1.0	in
Weight ($\pm 3\%$)	1.0	lbs.



TURbo PACKAGE OUTLINE DETAIL:

