



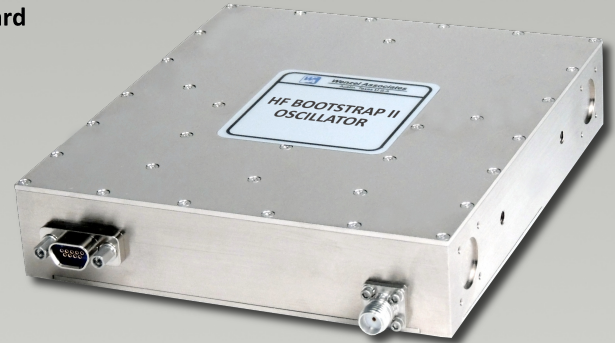
Low Noise Crystal Oscillators > HF Bootstrap II

Features:

- Frequencies from 10 MHz to 25 MHz, fixed
- Ruggedized for Dynamic Environments
- Standard or Premium Phase Noise Options
- Effective G-Sensitivity to $\leq 2E-11/g$ per axis
- Externally Vibration Isolated Version Available with Effective G-Sensitivity to $2E-12/g$ (2 kHz)

Applications:

- Military Applications
- Airborne, Ground, Shipboard
- Radar Systems
- Tactical Radio
- Vehicular Communication



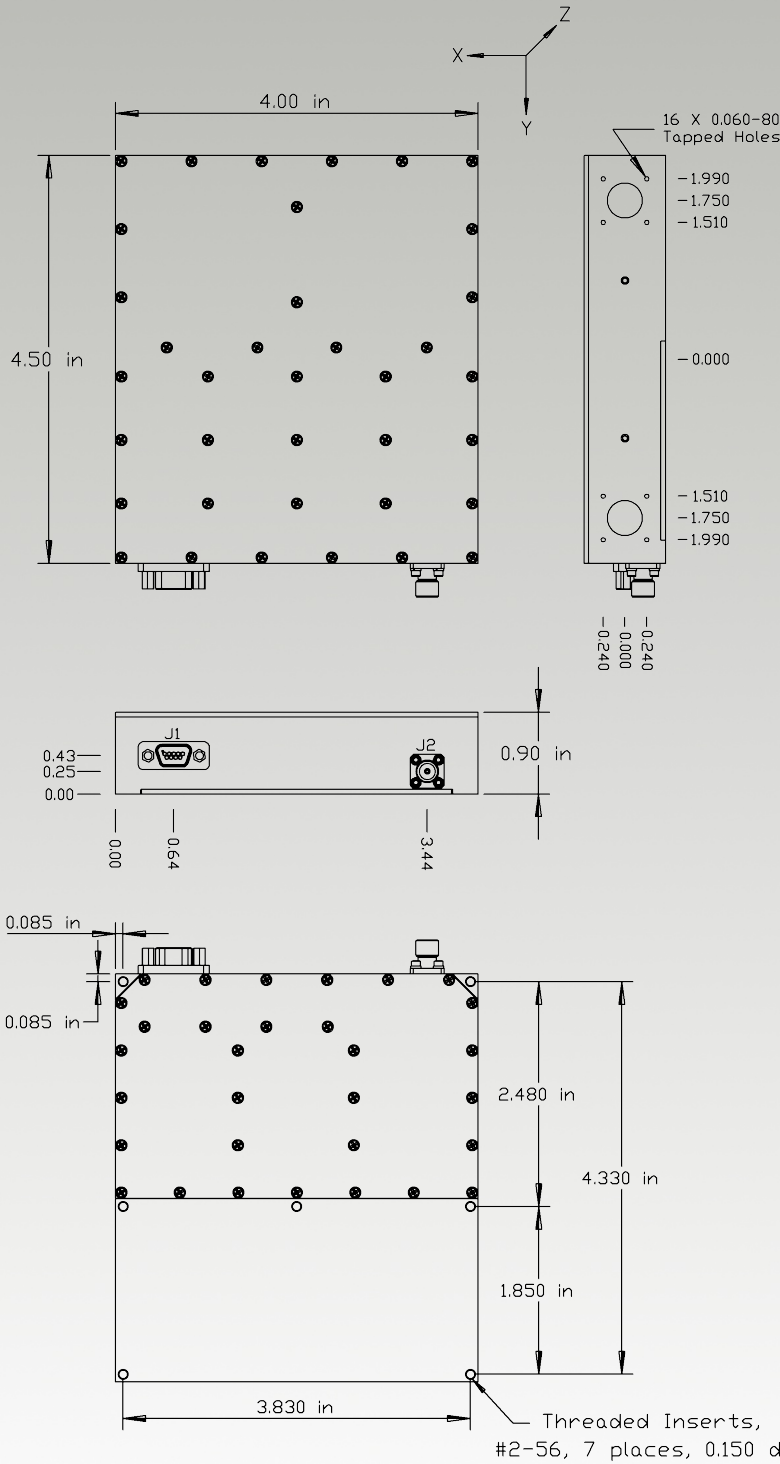
Electrical Specifications	
Output Frequency (fixed; specify within range)	10 MHz to 25 MHz
Output Level	+13 dBm ± 2 dB into 50 ohms
Aging	(10 MHz model, typical)
Per day after 30 days operating, typical	5×10^{-10}
Second year, typical	5×10^{-8}
Per year thereafter, typical	3×10^{-8}
Temperature Stability (consult factory for other ranges)	(10 MHz model, typical)
Range E: 0 to +50°C (Ref: +25°C)	$\leq \pm 5 \times 10^{-8}$
Range F: -20 to +70°C (Ref: +25°C)	$\leq \pm 1 \times 10^{-7}$
Range G: -55 to +85°C (Ref: +25°C)	$\leq \pm 5 \times 10^{-7}$
Phase Noise	(Frequency Dependent: See Standard Specifications and Part Numbers table below for details)
Harmonics	≤ -30 dBc
Sub-Harmonics	≤ -60 dBc
PLL Products (Phase Lock models only)	≤ -60 dBc
Spurious	≤ -80 dBc
Natural Mount Resonant Frequency	~ 30 Hz (Vibe Iso Model Only)
Tuning	
- Mechanical Tuning	N/A
- Electrical Tuning	
Tuning A: 0 to +10 VDC	$\geq \pm 5 \times 10^{-7}$, typical
Tuning B: ± 5 VDC	$\geq \pm 5 \times 10^{-7}$, typical
Slope: Negative	(Positive Slope available on some ET only models)
Supply Voltage	+15 VDC $\pm 5\%$ or +12 VDC $\pm 5\%$
Warm-up	≤ 13 Watts for 5 minutes at +25°C
Total	≤ 10 Watts at +25°C
Crystal Type	SC-cut
Acceleration Sensitivity	Effective G-Sensitivity to $2 \times 10^{-11}/g$ at offsets from 5 Hz to ~ 500 Hz Effective G-Sensitivity to $2 \times 10^{-12}/g$, isolated
Mechanical	
Packaging	Nickel Plated Machined Aluminum Case (Standard) or Nickel Plated Steel Case (for EMI and/or Vibe Iso)
Dimensions	4.5 x 4.0 x 0.9"
Weight	≤ 0.5 lbs (aluminum case) ≤ 2 lbs (steel case)
Connectors / Mounting	SMA(f) and micro-D Threaded Inserts, #2-56, 0.15 diam., 7 places

Description:

At HF frequencies, the Bootstrap oscillator provides unprecedented low-g sensitivity to $2e-11/g$. The standard Bootstrap oscillator consists of two rugged OCXOs of the same frequency, which can be any fixed frequency between 10 MHz and 25 MHz, and all necessary components to phase lock the two oscillators together. Special compensation techniques are used to minimize vibration induced phase noise including positioning the two oscillators mechanically in two axes to offset vibration sensitivity as well as adjusting the electrical tuning of both oscillators with a properly scaled compensation voltage. The Bootstrap oscillator assembly is an ideal solution for the most demanding airborne, mobile and shipboard applications requiring greatly improved dynamic phase noise performance with effective acceleration sensitivity performance approaching $2E-11/g$ per axis. Effective acceleration sensitivity to $2E-12/g$ can be realized with the addition of an external vibration isolation system, assuming a typical natural mount resonant frequency around ~ 30 Hz. The assembly is housed in a 4.5" x 4.0" x 0.9" machined aluminum case. An internal voltage regulator is provided for excellent power supply line rejection. Please consult the factory if you need any specifications to be modified to better suit your application.



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Connector	Function
J1-1	Supply Voltage
J1-5	Ground, Case
J1-7	Electrical Tuning
J1-2, 3, 4, 6, 8, 9	N/C
J2	RF Output

