Wenzel Associates, Inc.

"Quietly the Best"

PL-OCXO
MXO-PLD

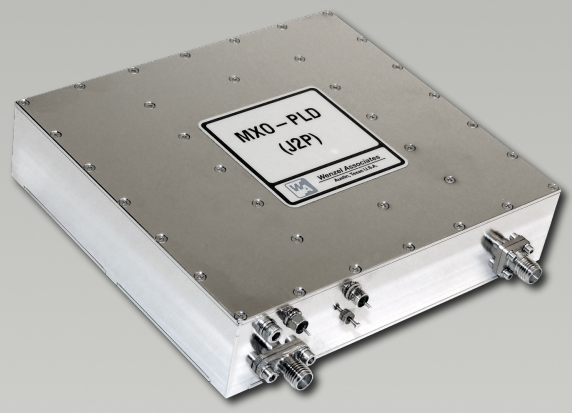
Low Noise Crystal Oscillators > MXO (PLO w/ Dividers)

Features:

- PLO with Integrated Multipliers
- Frequency Dividers Used When Phase Locking
- Frequencies from 200 MHz to 12 GHz, fixed
- Ultra Low Phase Noise Performance
- Excellent Spectral Purity
- Easily Customized to Specific Frequency

Applications:

- Military Applications
- Radar Systems
- Test Equipment
- Instruments
- Reference Source



Electrical Specifications	
Output Frequency (fixed; specify within range)	**200 MHz to 12 GHz**
Output Level	+13 dBm ±2 dB into 50 ohms
External Reference Input Frequency	10 MHz *(standard; other options available)*
External Reference Input Level	+7 dBm ±6 dB into 50 ohms
Aging	
Per day after 30 days operating, typical	5×10^{-9}
Second year, typical	5×10^{-7}
Per year thereafter, typical	3×10^{-7}
Temperature Stability *(consult factory for other ranges)*	
Range E: 0 to +50°C (Ref: +25°C)	$\leq \pm 5 \times 10^{-7}$
Range F: -20 to +70°C (Ref: +25°C)	$\leq \pm 1 \times 10^{-6}$
Phase Noise	*(Frequency Dependent: See Standard Specifications and Part Numbers table below for details)*
Harmonics	≤ -25 dBc
Sub-Harmonics	≤ -60 dBc
PLL & Divider Products	≤ -60 dBc
Spurious	≤ -80 dBc
PLL Loop Bandwidth	≤ 10 Hz, typical
Supply Voltage	+15 VDC or +12 VDC (±5%)
Warm-up	≤ 9 to 19 Watts for 5 minutes at +25°C
Total	≤ 6 to 16 Watts at +25°C
Crystal Type	SC-cut
Crystal Acceleration Sensitivity	5×10^{-10}/g, typical; to 2×10^{-10}/g, available
Mechanical	
Packaging	Nickel-Plated Machined Aluminum
Dimensions	See Mechanical Drawing
Connectors / Mounting	SMA(f) and solder pins on side Threaded Inserts, #2-56, 6 places

Description:

The Multiplied Crystal Oscillator (MXO-PLD) is a fixed frequency industry leading ultra-low noise PLO highly integrated with one or more low noise multipliers stages to create a high performance frequency signal between 200 MHz and 12 GHz. The MXO-PLD also provides good temperature stability (when free-running) and excellent spectral purity. Frequency dividers are used to prescale the internal VHF oscillator and the external reference frequencies to phase lock at a common lower frequency. The PLL loop bandwidth is typically ≤ 10 Hz, but can be configured for optimal performance considering the reference signal provided. The package varies depending on the number of multiplier stages needed to create the desired frequency and range in size from 3.45" x 4" x 1", 4.40" x 4" x 1" and 5.36" x 4" x 1". The base VHF oscillator frequency and multiple outputs are available as options. (i.e. If ordering a 10 GHz MXO-PLD, you may also request the 100 MHz, 500 MHz and 5 GHz outputs since they are also being created in the multiplier string.) 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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Low Noise Crystal Oscillators > MXO (PLO w/ Dividers)

500 MHz MXO-PLD
(free-running)

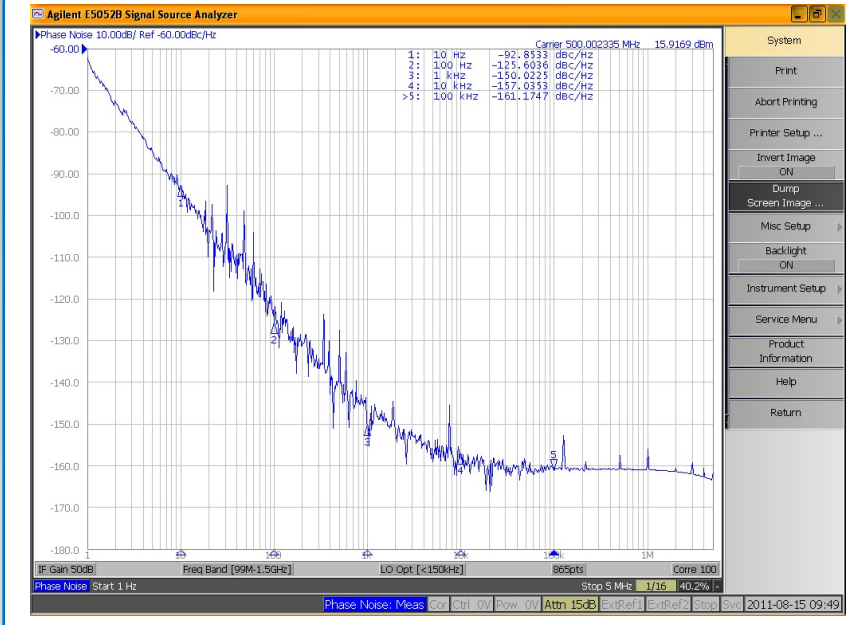

Figure 1: Typical Phase Noise Performance Plot
for the 500 MHz MXO-PLD, P/N: 501-23950

Standard Specifications and Part Numbers **

Part Number	Output Frequency * (MHz)	Typical Phase Noise (dBc/Hz), Static * (free-running)					Output Level (dBm) * into 50 ohms	Temperature Stability (Ref: +25°C) *	Supply Voltage (VDC)	Acceleration Sensitivity (/g per axis) *	External Reference Frequency (MHz)	Package / Connectors	Package Size (inches)
		10 Hz	100 Hz	1 kHz	10 kHz	100 kHz							
501-21935	200	-93	-123	-151	-167	-168	+13 ±2	±5E-7, 0 to +50°C	+15	5E-10, typ	10, LBW≤10 Hz	SMA(f) & Pins on Side	3.45 x 4 x 1
501-25382	300	-89	-119	-147	-163	-164	+13 ±2	±5E-7, 0 to +50°C	+15	5E-10, typ	10, LBW≤10 Hz	SMA(f) & Pins on Side	3.45 x 4 x 1
501-25386	400	-87	-117	-144	-160	-161	+13 ±2	±5E-7, 0 to +50°C	+15	5E-10, typ	10, LBW≤10 Hz	SMA(f) & Pins on Side	3.45 x 4 x 1
501-23950	500	-85	-115	-143	-159	-160	+13 ±2	±5E-7, 0 to +50°C	+15	5E-10, typ	10, LBW≤10 Hz	SMA(f) & Pins on Side	3.45 x 4 x 1
501-25388	512	-74	-104	-134	-159	-160	+13 ±2	±5E-7, 0 to +50°C	+15	5E-10, typ	10, LBW≤10 Hz	SMA(f) & Pins on Side	3.45 x 4 x 1
501-25392	640	-82	-112	-137	-153	-154	+13 ±2	±5E-7, 0 to +50°C	+15	5E-10, typ	10, LBW≤10 Hz	SMA(f) & Pins on Side	4.4 x 4 x 1
501-21081	1000	-77	-109	-136	-153	-154	+13 ±2	±5E-7, 0 to +50°C	+15	5E-10, typ	10, LBW≤10 Hz	SMA(f) & Pins on Side	3.45 x 4 x 1
501-24798	1280	-76	-106	-131	-148	-149	+13 ±2	±5E-7, 0 to +50°C	+15	5E-10, typ	10, LBW≤10 Hz	SMA(f) & Pins on Side	4.40 x 4 x 1
501-25403	5120	-63	-93	-118	-135	-136	+13 ±2	±5E-7, 0 to +50°C	+15	5E-10, typ	10, LBW≤10 Hz	SMA(f) & Pins on Side	5.36 x 4 x 1
501-24230	10000	-57	-87	-113	-131	-132	+13 ±2	±5E-7, 0 to +50°C	+15	5E-10, typ	10, LBW≤10 Hz	SMA(f) & Pins on Side	5.36 x 4 x 1
501-25413	10240	-57	-87	-112	-129	-130	+13 ±2	±5E-7, 0 to +50°C	+15	5E-10, typ	10, LBW≤10 Hz	SMA(f) & Pins on Side	5.36 x 4 x 1
501-24245	12000	-55	-85	-111	-126	-127	+13 ±2	±5E-7, 0 to +50°C	+15	5E-10, typ	10, LBW≤10 Hz	SMA(f) & Pins on Side	5.36 x 4 x 1
501-25477	1000/500/100	-77	-109	-136	-153	-154	+13 ±2	±5E-7, 0 to +50°C	+15	5E-10, typ	10, LBW≤10 Hz	SMA(f) & Pins on Side	4.40 x 4 x 1
501-25475	500/100	-85	-115	-143	-159	-160	+13 ±2	±5E-7, 0 to +50°C	+15	5E-10, typ	10, LBW≤10 Hz	SMA(f) & Pins on Side	3.45 x 4 x 1

* Consult factory for custom frequency, phase noise performance, output level, temperature stability and acceleration sensitivity options.
** See website for additional Standard Part Numbers and Specifications.

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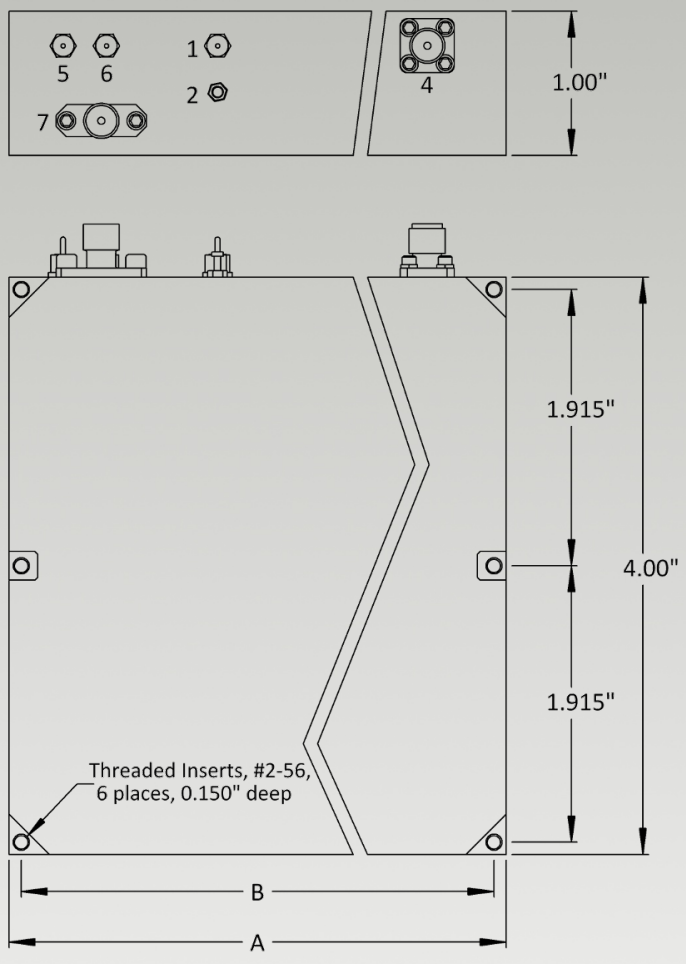

MXO-PLD

Package	Dimension A	Dimension B
J1P	3.45"	3.275"
J2P	4.40"	4.230"
J3P	5.36"	5.185"

Connector	Function
1	Supply Voltage
2	Ground, Case
4	RF Output
5	Phase Lock Voltage
6	Phase Lock Alarm
7	External Reference Input

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