



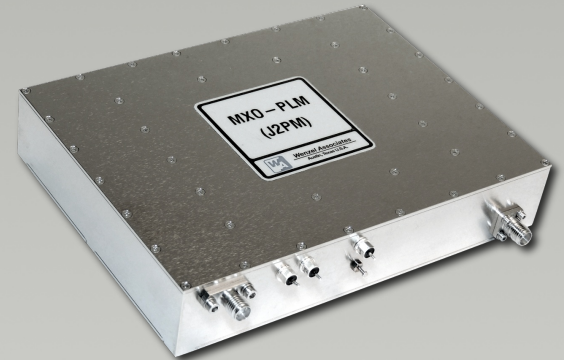
Low Noise Crystal Oscillators > MXO (PLO w/ Ref. Multipliers)

Features:

- PLO with Integrated Multipliers
- Reference Multipliers 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



Description:

The Multiplied Crystal Oscillator (MXO-PLM) 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-PLM also provides good temperature stability (when free-running) and excellent spectral purity. Additional frequency multipliers are used to multiply the external reference up to phase lock at the internal VHF oscillator frequency. This allows the PLL loop bandwidth to be set between ~200 and ~300 Hz, and can be configured for optimal performance considering the reference signal provided. The higher loop bandwidth allows the close-in phase noise of the MXO output to be improved if a low noise reference signal is provided. The package varies depending on the number of multiplier stages needed to create the desired frequency and range in size from 4.40" x 4" x 1", 5.36" x 4" x 1" and 6.31" x 4" x 1". The base VHF oscillator frequency and multiple outputs are available as options. (i.e. If ordering a 10 GHz MXO-PLM, 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.

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	+13 dBm ±1 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 & Reference Multiplier Products	≤ -60 dBc
Spurious	≤ -80 dBc
PLL Loop Bandwidth	~250 Hz, typical
Supply Voltage	+15 VDC or +12 VDC (±5%)
Warm-up	≤ 11 to 22 Watts for 5 minutes at +25°C
Total	≤ 7 to 18 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





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100/500 MHz MXO-PLM
(100 MHz output, phase locked to an external 10 MHz Streamline)

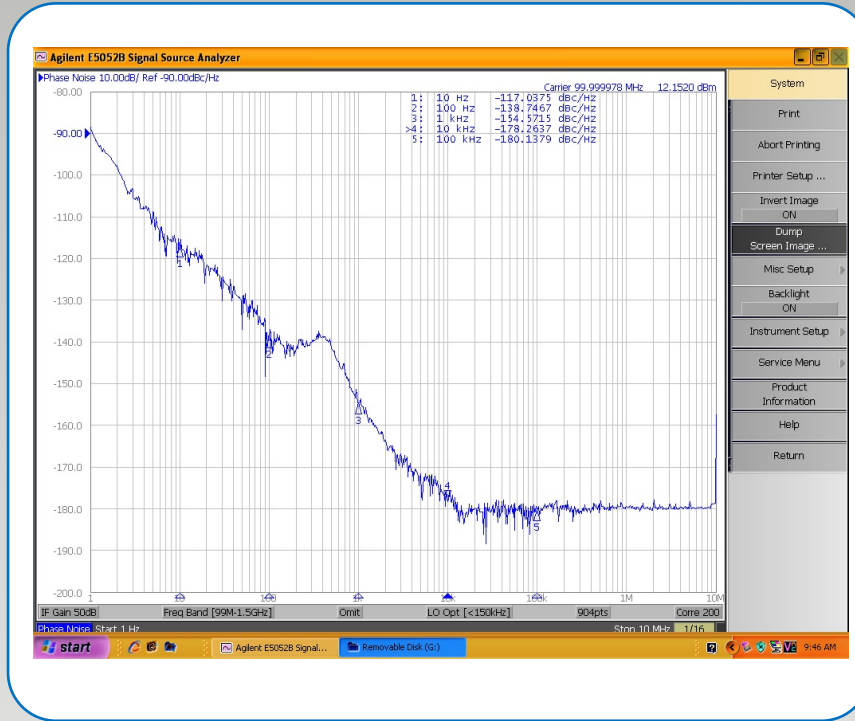


Figure 1: Typical Phase Noise Performance Plot for the 100 MHz output of 100/500 MHz MXO-PLM, P/N: 501-25486, phase locked with a 10 MHz Streamline P/N: 501-27501-11.

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							
501-25748	200	-93	-123	-151	-167	-168	+13 ±2	±5E-7, 0 to +50°C	+15	5E-10, typ	10, LBW≤250 Hz	SMA(f) & Pins on Side	4.40 x 4 x 1
501-25750	320	-89	-119	-144	-160	-161	+13 ±2	±5E-7, 0 to +50°C	+15	5E-10, typ	10, LBW≤250 Hz	SMA(f) & Pins on Side	4.40 x 4 x 1
501-25751	400	-87	-117	-144	-160	-161	+13 ±2	±5E-7, 0 to +50°C	+15	5E-10, typ	10, LBW≤250 Hz	SMA(f) & Pins on Side	4.40 x 4 x 1
501-25484	500	-85	-115	-143	-159	-160	+13 ±2	±5E-7, 0 to +50°C	+15	5E-10, typ	10, LBW≤250 Hz	SMA(f) & Pins on Side	4.40 x 4 x 1
501-25754	640	-82	-112	-137	-153	-154	+13 ±2	±5E-7, 0 to +50°C	+15	5E-10, typ	10, LBW≤250 Hz	SMA(f) & Pins on Side	5.36 x 4 x 1
501-25757	840	-72	-102	-132	-155	-156	+13 ±2	±5E-7, 0 to +50°C	+15	5E-10, typ	10, LBW≤250 Hz	SMA(f) & Pins on Side	4.40 x 4 x 1
501-21440	1000	-77	-109	-136	-153	-154	+13 ±2	±5E-7, 0 to +50°C	+15	5E-10, typ	10, LBW≤250 Hz	SMA(f) & Pins on Side	4.40 x 4 x 1
501-25762	1920	-64	-94	-123	-147	-148	+13 ±2	±5E-7, 0 to +50°C	+15	5E-10, typ	10, LBW≤250 Hz	SMA(f) & Pins on Side	5.36 x 4 x 1
501-25766	5120	-63	-93	-118	-135	-136	+13 ±2	±5E-7, 0 to +50°C	+15	5E-10, typ	10, LBW≤250 Hz	SMA(f) & Pins on Side	6.31 x 4 x 1
501-25492	10000	-57	-87	-113	-131	-132	+13 ±2	±5E-7, 0 to +50°C	+15	5E-10, typ	10, LBW≤250 Hz	SMA(f) & Pins on Side	6.31 x 4 x 1
501-25770	10240	-57	-87	-112	-129	-130	+13 ±2	±5E-7, 0 to +50°C	+15	5E-10, typ	10, LBW≤250 Hz	SMA(f) & Pins on Side	6.31 x 4 x 1
501-25772	12000	-55	-85	-111	-126	-127	+13 ±2	±5E-7, 0 to +50°C	+15	5E-10, typ	10, LBW≤250 Hz	SMA(f) & Pins on Side	6.31 x 4 x 1
501-25488	1000/500/100	-79	-109	-136	-153	-154	+13 ±2	±5E-7, 0 to +50°C	+15	5E-10, typ	10, LBW≤250 Hz	SMA(f) & Pins on Side	5.36 x 4 x 1
501-25486	500/100	-85	-115	-143	-159	-160	+13 ±2	±5E-7, 0 to +50°C	+15	5E-10, typ	10, LBW≤250 Hz	SMA(f) & Pins on Side	4.40 x 4 x 1

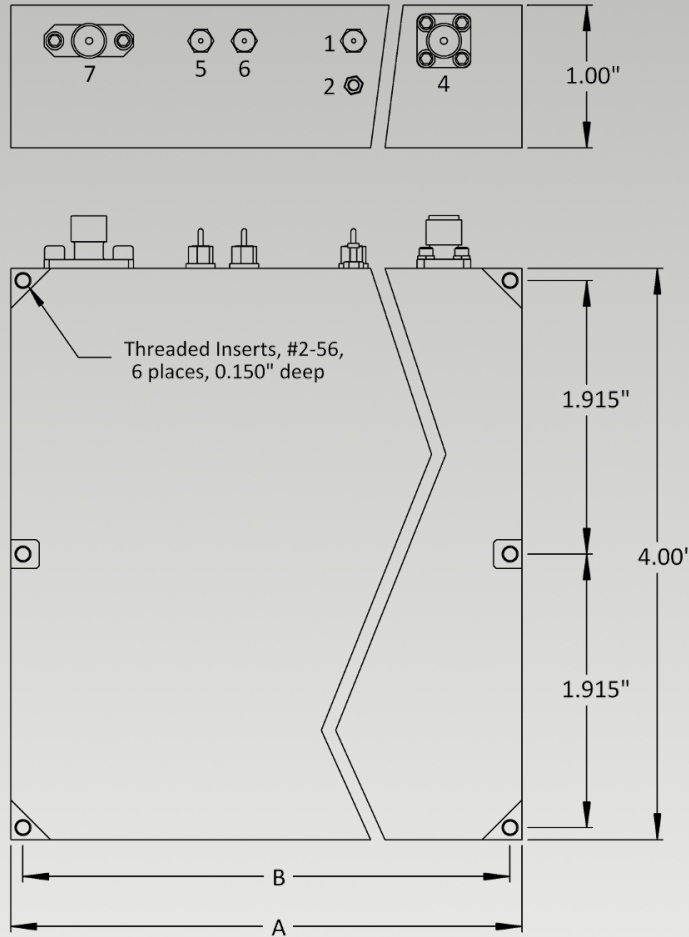
* Consult factory for custom frequency, phase noise performance, output level, temperature stability and acceleration sensitivity options.

** See website for additional Standard Part Numbers and Specifications.





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MXO-PLM

Package	Dimension A	Dimension B
J1PM	4.40"	4.230"
J2PM	5.36"	5.185"
J3PM	6.31"	6.140"

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

