

## INPUT

### Frequency

10 MHz

### Level

+13 dBm  $\pm 2$  dB into 50 ohms

## OUTPUT

### Frequency

70 MHz

### Level

+13 dBm  $\pm 2$  dB into 50 ohms

## STABILITY

### Aging (free-running)

$1 \times 10^{-6}$  first year

after 30 days operating, typical

$5 \times 10^{-7}$  second year, typical

$3 \times 10^{-7}$  per year thereafter, typical

### Phase Noise L(f), (free-running)

10 Hz -100 dBc/Hz

100 Hz -130 dBc/Hz

1 KHz -158 dBc/Hz

10 KHz -176 dBc/Hz

100 KHz -176 dBc/Hz

### Temperature Stability

$\pm 5 \times 10^{-7}$  free-running from 0 to +50°C  
(Ref. +25°C)

### Harmonics

-25 dBc

### Sub-Harmonics

-80 dBc

### Spurious

-80 dBc, excluding power  
supply line related spurs

### Phase Lock Alarm

TTL

Locked: +3.5 VDC to +5.2 VDC (Hi)

Out-of-Lock: +0.8 VDC max (Lo)

### Phase Lock Voltage Monitor

Voltage monitor pin supplied

## MECHANICAL

### Dimensions

4.40 x 4.00 x 1"

### Connectors

RF Input/Output: SMA(f)

Power, Monitoring: Feed Thru Terminals

GND: Ground Turret

## Packaging

Nickel-plated machined  
aluminum housing – J1PM

## Mounting

Threaded inserts on base, 6 places

## POWER REQUIREMENTS

### Warm-Up Power

$\leq 11$  Watts for 5 minutes

### Total Power

$\leq 7$  Watts at +25°C

### Supply Voltage

+15 VDC  $\pm 5\%$

## ADJUSTMENT

### Loop BW

Target Bandwidth: ~300 Hz

Type 2 Loop

## CRYSTAL

### Type

70 MHz SC-cut

## OTHER

### Design

Includes x7 multiplier on the front end to  
multiply the 10 MHz input to 70 MHz for  
phase locking to the internal oscillator.  
Loop BW will be optimized for best close-  
in phase noise performance using a  
Wenzel 10 MHz Streamline as the  
reference ( $\leq -140$  dBc/Hz at 10 Hz offset)

### Label

Use conventional label with the  
following information:

501-31502 (Current Rev.)

70 MHz PL ULN

+15 VDC

Serial # - Date Code

(Mark connectors with function)

### Test Data

- Output Level

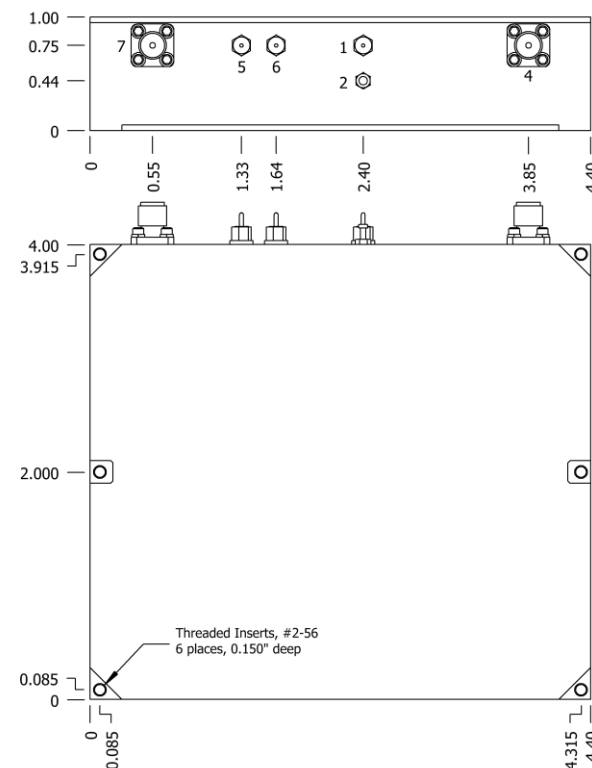
- Phase Noise – free-running

- Harmonics, PLL Products, Spurious

- Power – Warm-up and Total

REV	DATE	REVISION RECORD	DWN	AUTH
-	03-06-18	Initial Release	PAC	

J1PM MXO Connections	
Connector	Function
1	Supply Voltage
2	Ground, Case
4	RF Output
5	Phase Lock Voltage
6	Phase Lock Alarm
7	External Reference Input



**Wenzel Associates, Inc.**

Austin, Texas

Title:

**70 MHz PL Ultra Low Noise Crystal Oscillator**

P/N:

**501-31502**

Rev:

**-**

Date:

**03-06-18**

Drawn:

Ref:

Tolerances:  
(except as noted)  
Dimensions are in inches

0.XX Dec:

**$\pm 0.030$ "**

0.XXX Dec:

**$\pm 0.010$ "**

FSCM:

**62821**

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