



ONYX IV

Features:

- 30 MHz to 130 MHz
- Rugged/Low Cost/High Performance
- Low Phase Noise to -172 dBc/Hz
- G-Sensitivity to $3E-10/g$, typical
- Internal Voltage Regulator
- Lightweight < 30 grams

Applications:

- Military Applications
- Airborne, Ground, Shipboard
- Test Equipment
- Synthesizers
- Base Stations
- Portable Transceivers

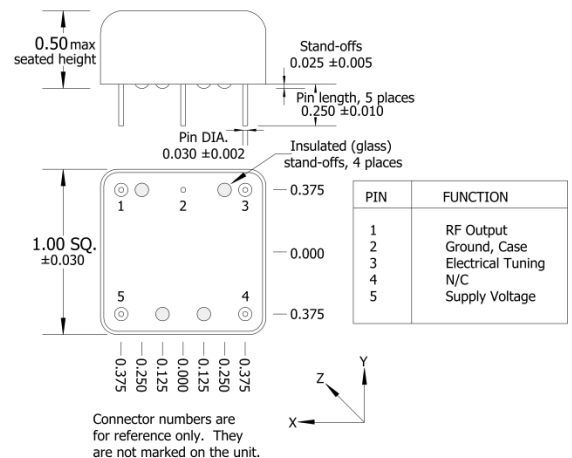
The ONYX IV is a small lightweight ruggedized OXCO featuring low phase noise (-165 dBc/Hz, standard), good temperature stability and low g-sensitivity (to $3E-10/g$, typical). Designed for Military PCB mount applications to provide excellent phase noise performance during vibration. The nickel-plated steel package is only 1" x 1" x 0.5" to house this full featured oscillator, which also includes an internal voltage regulator to provide excellent power supply line rejection. Please consult the factory if you need any specifications to be modified to better suit your application.

Typical Specifications

See Standard Specifications and Part Numbers on Page 2

Frequency (fixed, please specify)	30 MHz to 130 MHz		
Output Level	+10 ±2 dBm into 50 ohms		
Aging	1 x 10 ⁻⁶ per year after 30 days operating, typical		
Phase Noise, Typical	50 MHz	100 MHz	
	10 Hz	-100 dBc/Hz	-95 dBc/Hz
	100 Hz	-130 dBc/Hz	-125 dBc/Hz
	1 kHz	-150 dBc/Hz	-150 dBc/Hz
	10 kHz	-165 dBc/Hz	-165 dBc/Hz
	100 kHz	-165 dBc/Hz	-165 dBc/Hz
Temperature Stability	Range A: 0 to +50°C (Ref: +25°C)	≤ 2 x 10 ⁻⁷	
	Range B: -20 to +70°C (Ref: +25°C)	≤ 5 x 10 ⁻⁷	
	Range C: -40 to +85°C (Ref: +25°C)	≤ 1.5 x 10 ⁻⁶	
		≤ -30 dBc	
Harmonics	≤ -30 dBc		
Spurious	≤ -80 dBc		
Electrical Tuning	Tuning A: 0 to +10 VDC	±5 ppm	
	Tuning B: ±5 VDC	Positive	
	Slope:		
Supply Voltage	+12 ±1 VDC		
Warm-up Power	≤ 5 Watts for 2.5 minutes		
Total Power	≤ 1.5 Watts at +25°C		
Crystal Type	SC-cut		
Packaging	Nickel-plated solder sealed steel can		
Dimensions	< 1.03" x 1.03" x 0.5", max		
Connectors	Solder pins on base		

Mechanical Drawing





Static Phase Noise Plot

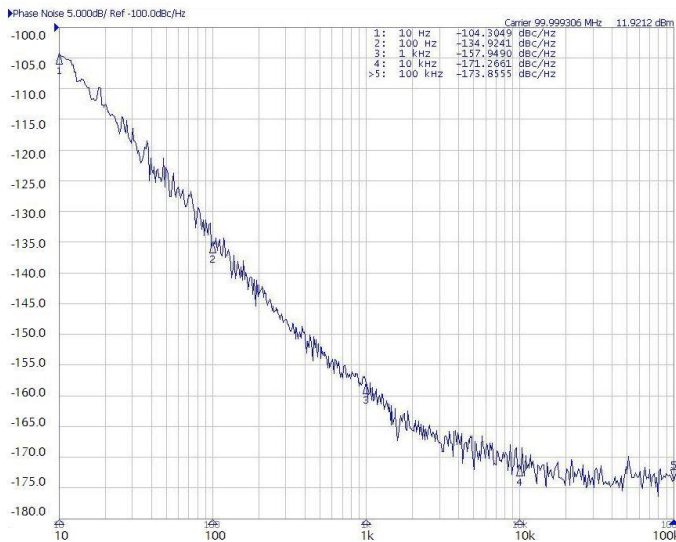


Figure 1: Typical Static Phase Noise Performance for the 100 MHz ONYX IV, P/N: 501-24760-03

Dynamic Phase Noise Plot

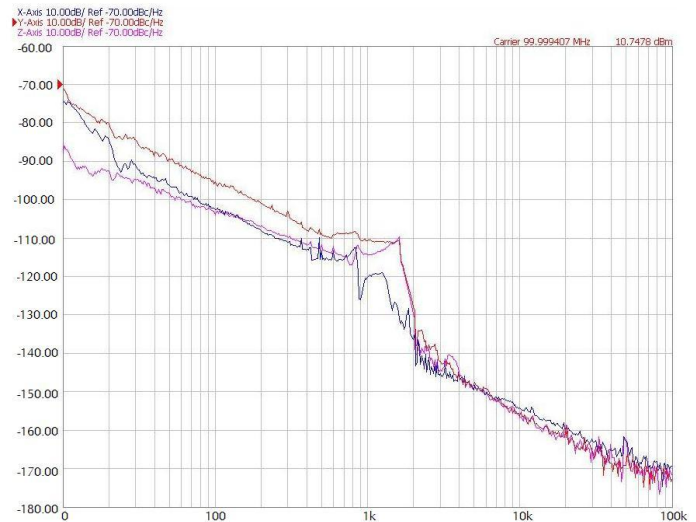


Figure 2: Typical Phase Noise Performance Under Vibration for the 100 MHz ONYX IV, P/N: 501-24762-02
10 Hz to 1 kHz, 0.06 g²/Hz; 1 kHz to 2 kHz, -6dB/Octave; 2 kHz, 0.015 g²/Hz

Standard Specifications and Part Numbers

Output Frequency ¹	Description	Typical Phase Noise (dBc/Hz), Static					Crystal Type	G-Sensitivity	Test Data Provided	Dynamic Phase Noise Testing	Part Number (Click on PN below to see detailed spec sheet)	Rev
		10 Hz	100 Hz	1 kHz	10 kHz	100 kHz						
100 MHz	Standard ONYX IV	-95	-120	-145	-165	-165	SC-cut, 5th OT	±5E-10/g per axis, typ	Yes ²	No	501-24760-01	A
100 MHz	Standard+ ONYX IV	-97	-125	-150	-168	-168	SC-cut, 5th OT	±5E-10/g per axis, typ	Yes ²	No	501-24760-02	A
100 MHz	Premium ONYX IV	-99	-130	-155	-170	-172	SC-cut, 5th OT	±5E-10/g per axis, typ	Yes ²	No	501-24760-03	A
100 MHz	Standard ONYX IV	-90	-122	-140	-160	-165	SC-cut, 3rd OT	±3E-10/g per axis, typ	Yes ²	Yes ³	501-24761-01	A
100 MHz	Standard ONYX IV	-90	-122	-140	-160	-165	SC-cut, 3rd OT	±3E-10/g per axis, guaranteed	Yes ²	Yes ³	501-24761-02	A
100 MHz	Standard ONYX IV	-90	-122	-140	-160	-165	SC-cut, 3rd OT	±2E-10/g per axis, guaranteed	Yes ²	Yes ³	501-24761-03	A
100 MHz	Premium ONYX IV	-95	-127	-152	-165	-172	SC-cut, 3rd OT	±3E-10/g per axis, typ	Yes ²	Yes ⁴	501-24762-01	A
100 MHz	Premium ONYX IV	-95	-127	-152	-165	-172	SC-cut, 3rd OT	±3E-10/g per axis, guaranteed	Yes ²	Yes ⁴	501-24762-02	A
100 MHz	Premium ONYX IV	-95	-127	-152	-165	-172	SC-cut, 3rd OT	±2E-10/g per axis, guaranteed	Yes ²	Yes ⁴	501-24762-03	A

- Contact factory to discuss custom fixed frequency options between 30 MHz and 130 MHz.
- Tested at +25 ±5°C: Output Level, Static Phase Noise, Warm-up and Total Power; Temperature Stability.
- Phase noise under vibration testing with PSD of 0.06 g²/Hz at 100 Hz offset in one axis only.
- Phase noise under vibration testing in all three axes. (10 Hz to 1 kHz: 0.06 g²/Hz; 2 kHz: 0.015 g²/Hz) See Table 1.

Table 1 - 100 MHz ONYX (501-24761-02 or 501-24762-02), Expected Dynamic Performance

Vibration Frequency	10	30	100	300	500	1000	2000
Vibration Profile	0.06	0.06	0.06	0.06	0.06	0.06	0.015
L(f)	-65.7	-75.2	-85.7	-95.2	-99.7	-105.7	-117.7