Ultra Low Phase Noise "Apollo" Series

Bliley Technologies Inc.
2545 W Grandview Blvd
Erie, Pa 16506
Factory +1-814-838-3571

Features:

- **Stability as low as +/- 50 ppb over temperature**
- **High power output of +15dBm available**
- **Frequency Range from 30 MHz to 130 MHz**
- **Low profile package 0.460 inches max.**
- **Excellent long-term aging**
- **Low Power Consumption 1.5 Watt typical at +25C**
- **ROHS Compliant Version Available**
- **Low G-Sensitivity performance Optionally available to 0.2ppb/g @100MHz ***

Description:

The Apollo is the smallest offering from the Olympian OCVCXO Family. This high performance, miniature OCVCXO spans a wide frequency range and is specifically designed for applications requiring superior noise performance out to a 100KHz offset. It is ideal for phase-locked microwave signal sources such as DRO's, low noise test equipment, microwave com-systems, and radar applications.

Electrical Specifications

1. Output Characteristics

	Parameter	Min.	Typ.	Max.	Unit	Test Conditions
1.1	Frequency Range	30.0		130	MHz	
1.2	Initial Accuracy			±0.25	PPM	@ +25˚C±1˚C
1.3	Output Type		Sinusoidal			
1.4	Output Power	+10			dBm	Into 50Ω ± 10%
1.5	Load Impedance	45	50	55	Ω	
1.6	VSWR		2:1			Into 50Ω ± 10%
1.7	Harmonic Content			-30	dBc	Into 50Ω ± 10%
1.8	Spurious Modulation			-80	dBc	Into 50Ω ± 10%
1.9	Acceleration Sensitivity*		1.0	0.2	PPB/g	Typical of 100MHz

*Please consult factory for acceleration sensitivity options regarding other frequencies.

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2. Frequency Stability

	Parameter	Min.	Typ.	Max.	Unit	Test Conditions
2.1	Frequency vs. Temperature	±50, ±100, ±200, ±500			PPB	Referenced to +25˚C See Table 1 For Ordering Options
2.2	Aging					
	Per Day			±5.0	PPB	
	1st Year**			±0.500	PPM	
	10 Years **			±1.0	PPM	
	15 Years**			±1.5	PPM	
2.3	Frequency vs. Voltage		±5.0		PPB	± 5% Δ in supply
2.4	Frequency vs. Load		±5.0		PPB	± 10% Δ in Load
2.5	Allan Variance		5e-10			τ = 1 Second
2.6	Warm-up			±0.1	PPM	5 Minutes @ +25˚C±1˚C Referenced to 1 Hour
2.7	Static Phase Noise	Option A	Option B	Option C	Option D	See Table 1 for Ordering Options
	ℒ(f)@10Hz	-103	-100	-95	-90	dBc/Hz
	ℒ(f)@100Hz	-133	-130	-125	-120	dBc/Hz
	ℒ(f)@1KHz	-157	-155	-155	-152	dBc/Hz
	ℒ(f)@10KHz	-172	-168	-165	-165	dBc/Hz
	ℒ(f)@100KHz	-175	-172	-170	-170	dBc/Hz

Tested @ +25˚C±1˚C Static Environment

Values listed above are typical performance of a 100MHz Fo

**Long term aging projection is calculated per MIL-PRF 55310 f(t) = A(ln(Bt+1))+Fo

3. Input Characteristics

	Parameter	Min.	Typ.	Max.	Unit	Test Conditions
3.1	Supply Voltage	+12Vdc±5%,+15Vdc±5%			Vdc	See Table 1 for Ordering Options
3.2	Power Dissipation					
	Warm-up			4.8	Watts	@ Minimum Ambient Temp
	Steady State		1.5		Watts	@ +25˚C±1˚C

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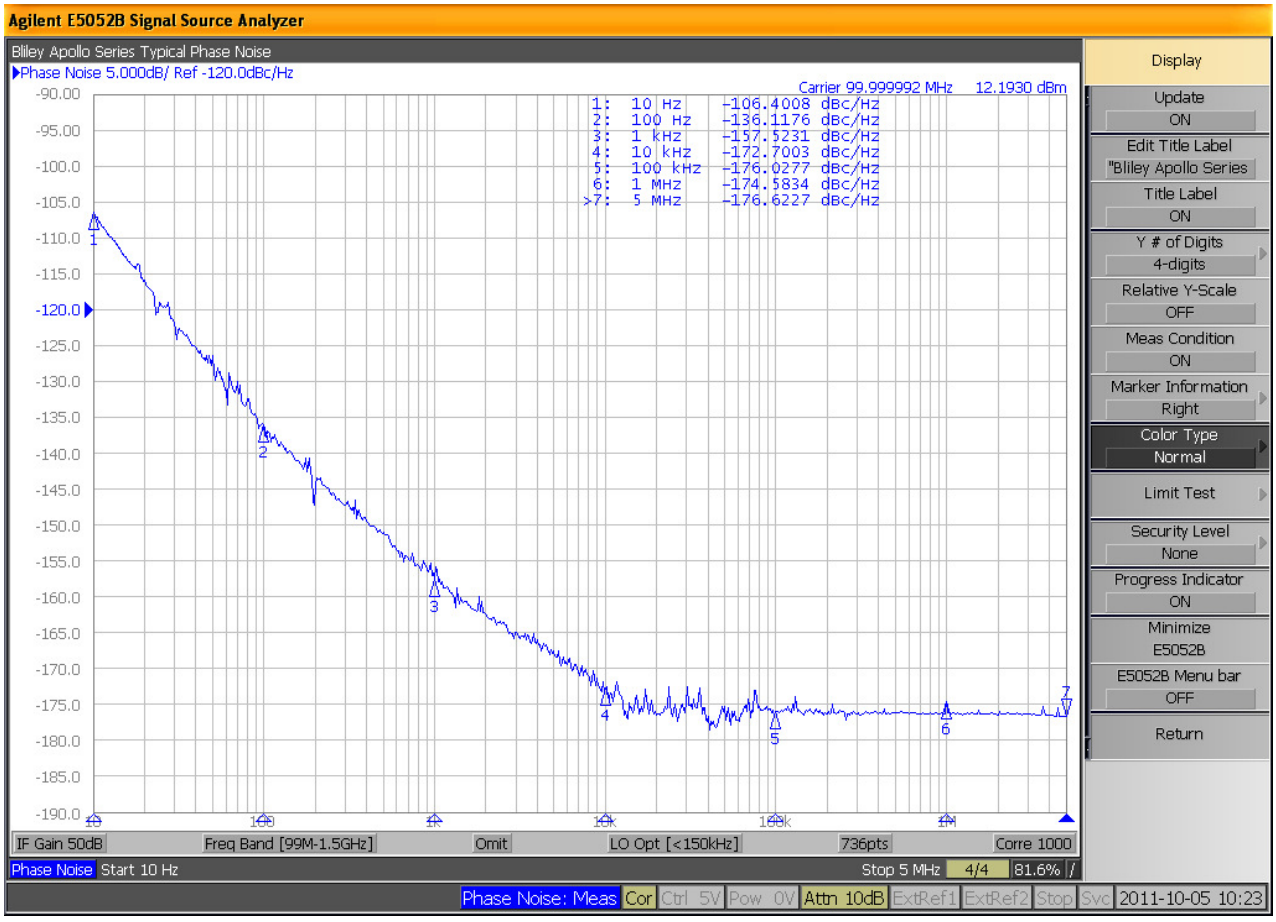
3. Input Characteristics (continued)

	Parameter	Min.	Typ.	Max.	Unit	Test Conditions
3.3	Electronic Frequency Control					
	Voltage Range	0		+10	Vdc	
	Center Voltage		+5.0		Vdc	
	Frequency Range		±1.0, ±2.0		PPM	See Table 1 for Ordering Options
	Slope		Positive			
	Input Impedance	100k			Ω	
	Linearity			± 10%		

Figure1. Typical 100MHz performance



***Phase Noise performance verified with the Agilent 5052B**
*** For Phase Noise performance at other frequencies please contact factory however at close to carrier offsets a 20*Log(N)dBc/Hz factor should be expected.**

4. Environmental, Reliability and Mechanical Specifications

	Parameter	Min.	Typ.	Max.	Unit	Test Conditions
4.1	Operational Temperature	-40		+85	˚C	See Table 1 For Ordering Options
4.2	Storage Temperature	-55		+95	˚C	
4.3	Shock	Mil-Std 202G Method 213 Condition C				
4.4	Random Vibration	Mil-Std 810G Method 514 Procedure I				
4.5	Sinusoidal Vibration	Mil-Std 202G Method 204 Condition A				
4.6	MTTF	153,300			Hours	Calculated using MIL-HDBK-217
4.7	Mechanical Package	Hermetically sealed package with glass feed through pins and glass risers (See Figure 2 for dimensions and pin functionality)				

Figure2. Mechanical Dimensions and Pin Functions

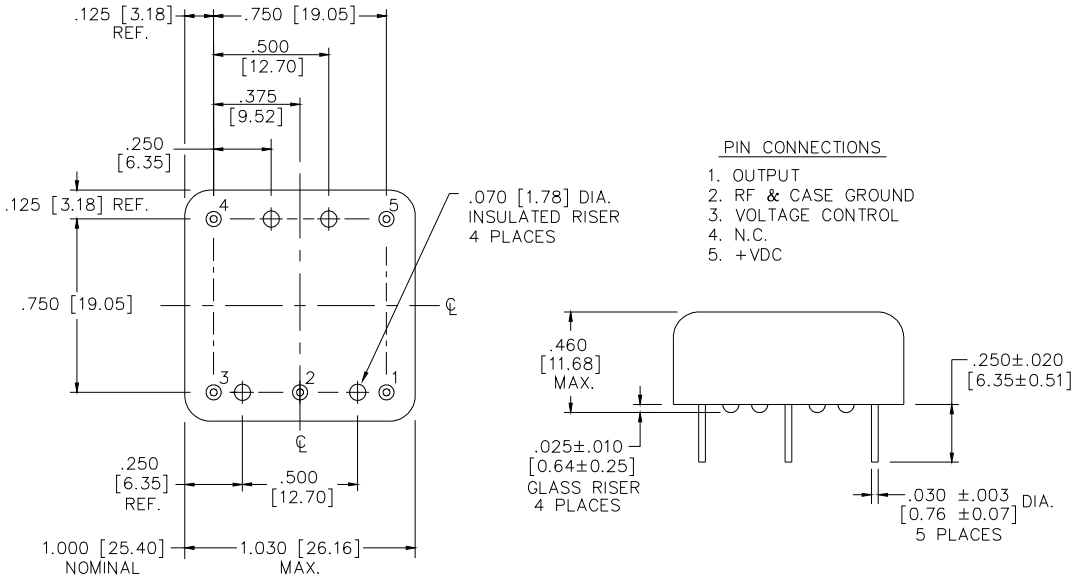


Table1. Ordering Information

	Phase Noise (dBc/Hz) (100MHz Phase Noise Performance)					Temp Range	Stability	EFC	Supply	Frequency
NV45AD	Offset	A	B	C	D	A (0°C-+50°C)	A (±50ppb)	A (±2ppm)	A (+12Vdc)	30M0 To 130M
	10Hz	-103	-100	-95	-90	B (-20°C-+70°C)	B (±100ppb)	B (±1ppm)	B (+15Vdc)	
	100Hz	-133	-130	-125	-120	C (-40°C-+70°C)	C (±200ppb)	C (Custom)		
NVG45AD (ROHS)	1KHz	-157	-155	-155	-152	D (-40°C-+85°C)	D (±500ppb)			
	10KHz	-172	-168	-165	-165	E (Custom)	E (Custom)			
	100KHz	-175	-172	-170	-170					
	Contact Factory for PHN performance at different Freq.									

*****Please build your Apollo part number below*****