



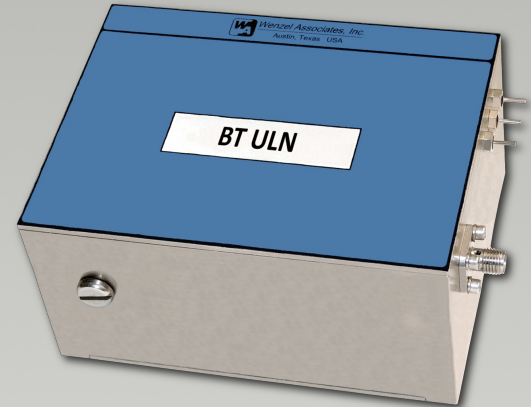
Low Noise Crystal Oscillators > Blue Top Ultra Low Noise

Features:

- Frequencies: 5 MHz or 10 MHz
- Ultra Low Phase Noise
- Excellent Temperature Stability
- Very Low Aging Rate
- Excellent Short Term Stability

Applications:

- PN Measurement Reference
- Synthesizers
- High Energy Physics
- Stable Reference Oscillator



Electrical Specifications	
Output Frequency (fixed; specify within range)	5 MHz or 10 MHz
Output Level	+13 dBm ±2 dB into 50 ohms
Aging	(5 MHz model, typical)
Per day after 30 days operating, typical	1 x 10 ⁻¹⁰
Second year, typical	5 x 10 ⁻⁸
Per year thereafter, typical	3 x 10 ⁻⁸
Temperature Stability (consult factory for other ranges)	(5 MHz model, typical)
Range E: 0 to +50°C (Ref: +25°C)	≤ ±5 x 10 ⁻¹⁰
Range F: -20 to +70°C (Ref: +25°C)	N/A
Range G: -55 to +85°C (Ref: +25°C)	N/A
Phase Noise	(Frequency Dependent: See Standard Specifications and Part Numbers table below for details)
Harmonics	≤ -30 dBc
Spurious	≤ -80 dBc
Tuning	(MT and ET ranges can be reversed upon request)
- Mechanical Tuning	≥ ±1 x 10 ⁻⁶ , typical
- Electrical Tuning	≥ ±2 x 10 ⁻⁷ , typical
Tuning A: 0 to +10 VDC	≥ ±2 x 10 ⁻⁷ , typical
Tuning B: ±5 VDC	≥ ±2 x 10 ⁻⁷ , typical
Slope: Negative	(Positive Slope available on some ET only models)
Supply Voltage	+15 VDC or +12 VDC (±5%)
Warm-up	≤ 10 Watts for 5 minutes at +25°C
Total	≤ 5 Watts at +25°C
Crystal Type	SC-cut
Mechanical	
Packaging	Nickel-Plated Machined Aluminum
Dimensions	4" x 3" x 2"
Connectors / Mounting	- Package A: SMA(f) and solder pins on side Threaded Inserts, #2-56, 4 places
	- Package B: SMA(f) dual and solder pins on side Threaded Inserts, #2-56, 4 places

Description:

The Blue Top Ultra Low Noise oscillator provides superb temperature stability, ultra-low phase noise performance and excellent short term stability. Commonly used in scientific instrumentation and timing systems which require the best stability and phase noise possible. The crystal is mounted in a large thermal mass which is isolated to provide the best short term stability and phase noise, typically better than -120 dBc/Hz at 1 Hz and -178 dBc/Hz at 10 kHz. The unit is available with temperature stability to ±5E-10 over the 0 to +50°C temperature range and an aging rate as low as 1E-10 per day. An internal doubler is optional, so 5 MHz and 10 MHz outputs may be provided simultaneously. A low noise internal voltage regulator is included, which provides excellent power supply line rejection. Please consult the factory to discuss any custom specification modifications which may better suit your application.



Low Noise Crystal Oscillators > Blue Top Ultra Low Noise

10 MHz BT ULN Phase Noise

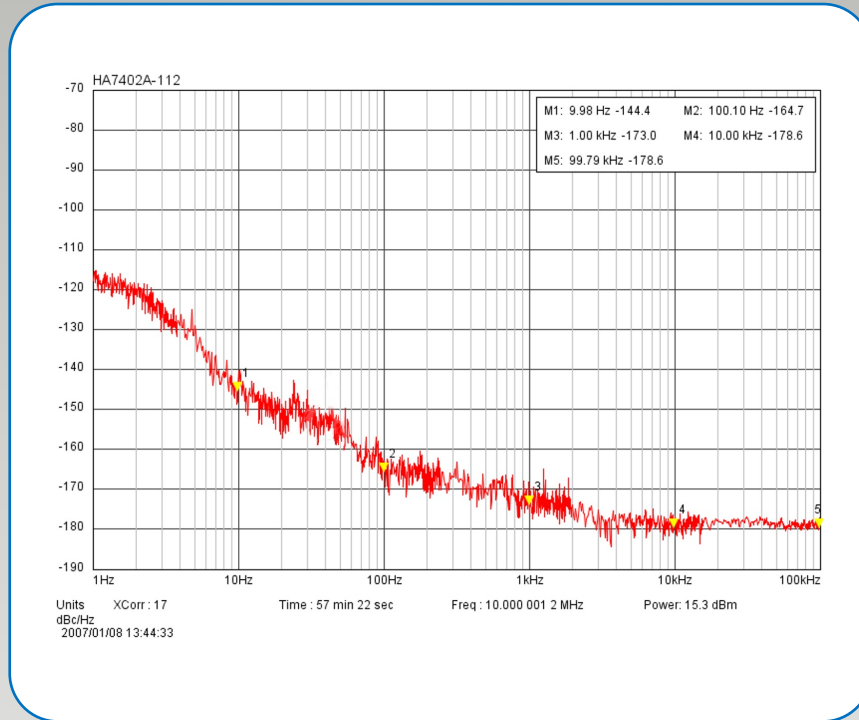


Figure 1: Typical Phase Noise Performance Plot for the 10 MHz BTULN, P/N: 501-27503-11

Standard Specifications and Part Numbers **

Part Number	Output Frequency * (MHz)	Typical Phase Noise (dBc/Hz), Static *					Output Level * (dBm) into 50 ohms	Temperature Stability * (Ref: +25°C)	Supply Voltage (VDC)	Package / Connectors	Package Size (inches)
		10 Hz	100 Hz	1 kHz	10 kHz	100 kHz					
501-27502-11	5	-150	-170	-176	-176	-176	+13 ±2	±5 x 10-10, 0° to +50°C	+15	A / SMA(f) & Pins on Side	4 x 3 x 2
501-27502-15	5, dual	-150	-170	-176	-176	-176	+13 ±2	±5 x 10-10, 0° to +50°C	+15	B / SMA(f) x 2 & Pins on Side	4 x 3 x 2
501-27502-31	5	-150	-170	-176	-176	-176	+13 ±2	±5 x 10-10, 0° to +50°C	+12	A / SMA(f) & Pins on Side	4 x 3 x 2
501-27502-35	5, dual	-150	-170	-176	-176	-176	+13 ±2	±5 x 10-10, 0° to +50°C	+12	B / SMA(f) x 2 & Pins on Side	4 x 3 x 2
501-27503-11	10	-143	-161	-173	-174	-174	+13 ±2	±5 x 10-10, 0° to +50°C	+15	A / SMA(f) & Pins on Side	4 x 3 x 2
501-27503-15	10, dual	-143	-161	-173	-174	-174	+13 ±2	±5 x 10-10, 0° to +50°C	+15	B / SMA(f) x 2 & Pins on Side	4 x 3 x 2
501-27503-31	10	-143	-161	-173	-174	-174	+13 ±2	±5 x 10-10, 0° to +50°C	+12	A / SMA(f) & Pins on Side	4 x 3 x 2
501-27503-35	10, dual	-143	-161	-173	-174	-174	+13 ±2	±5 x 10-10, 0° to +50°C	+12	B / SMA(f) x 2 & Pins on Side	4 x 3 x 2
501-27504-15	5/10	-143	-161	-167	-168	-168	+13 ±2	±5 x 10-10, 0° to +50°C	+15	B / SMA(f) x 2 & Pins on Side	4 x 3 x 2
501-27504-35	5/10	-143	-161	-167	-168	-168	+13 ±2	±5 x 10-10, 0° to +50°C	+12	B / SMA(f) x 2 & Pins on Side	4 x 3 x 2

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

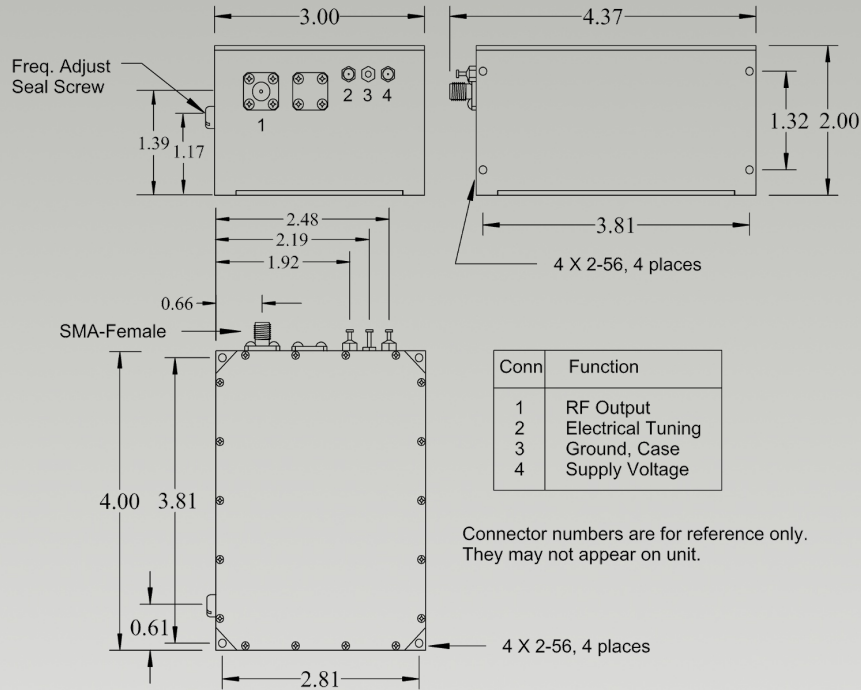
** See website for additional Standard Specifications and Part Numbers.





Low Noise Crystal Oscillators > Blue Top Ultra Low Noise

Package A



Package B

