WENZEL ASSOCIATES

# OCXO
# BT ULN

"QUIETLY THE BEST"

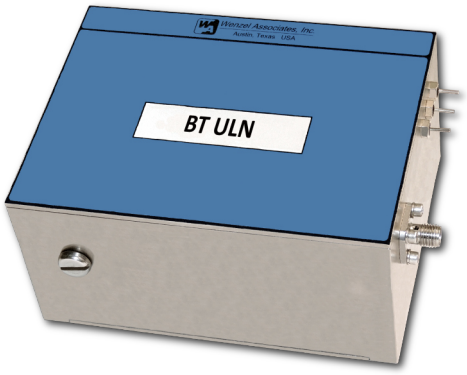
## LOW NOISE CRYSTAL OSCILLATORS > BLUE TOP ULTRA LOW NOISE

## FEATURES:

- Frequency: 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

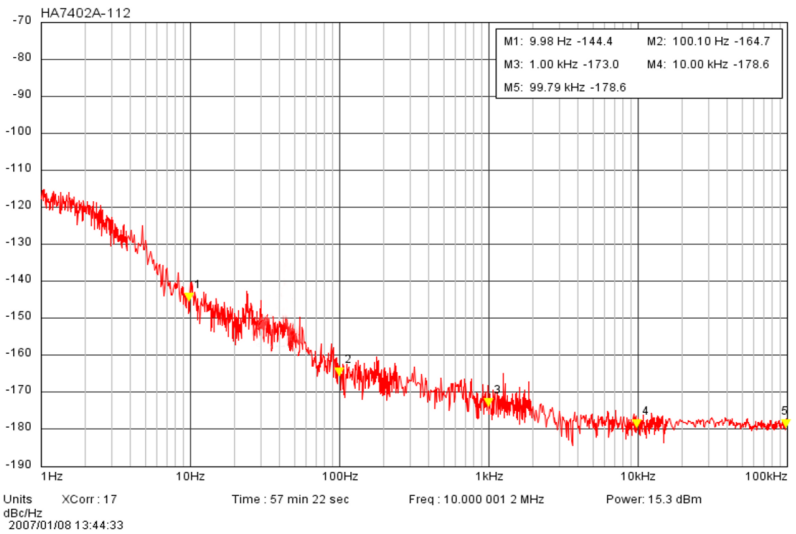



## DESCRIPTION:

The Blue Top Ultra Low Noise oscillator provides superb temperature stability 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 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.

| 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 | | $1 \times 10^{-10}$ |
| Second year, typical | | $5 \times 10^{-8}$ |
| Per year thereafter, typical | | $3 \times 10^{-8}$ |
| **Temperature Stability** (consult factory for other ranges) | | *(5 MHz model, typical)* |
| Range E: 0 to +50°C (Ref: +25°C) | | $\leq \pm 5 \times 10^{-10}$ |
| 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 Std. Specifications & Part Numbers table below for details)* |
| **Harmonics** | | ≤ -30 dBc |
| **Spurious** | | ≤ -80 dBc |
| **Tuning** | | *(MT and ET ranges can be reversed upon request)* |
| - Mechanical Tuning | | $\geq \pm 1 \times 10^{-6}$, typical |
| - Electrical Tuning | Tuning A: 0 to +10 VDC | $\geq \pm 2 \times 10^{-7}$, typical |
| | Tuning B: ±5 VDC | $\geq \pm 2 \times 10^{-7}$, 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** |

10 MHz BTULN
*P/N: 501-27503-11*

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06.23.2020

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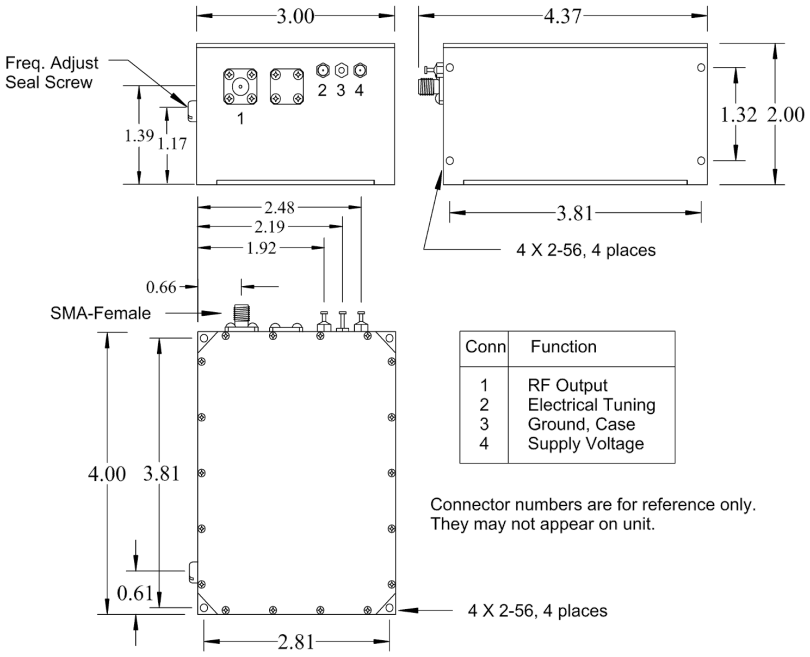
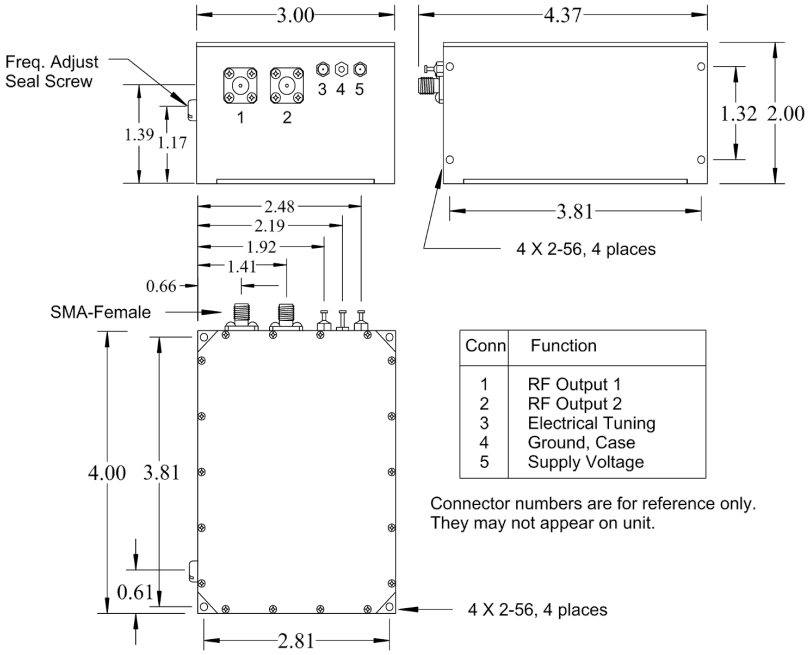
### PACKAGE A




| Conn | Function |
|---|---|
| 1 | RF Output |
| 2 | Electrical Tuning |
| 3 | Ground, Case |
| 4 | Supply Voltage |

Connector numbers are for reference only.
They may not appear on unit.

### PACKAGE B




| Conn | Function |
|---|---|
| 1 | RF Output 1 |
| 2 | RF Output 2 |
| 3 | Electrical Tuning |
| 4 | Ground, Case |
| 5 | Supply Voltage |

Connector numbers are for reference only.
They may not appear on unit.

## 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.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