



# Precision OCXO OX400-620LF

# CONNOR WINFIELD



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## Description:

The Connor-Winfield OX400-620LF, a 14-Pin DIP Oven Stabilized Crystal Oscillator (OCXO), is a precise frequency standard excellent for use in cellular base stations, test equipment, Synchronous Ethernet, VSAT, and Stratum 3 applications.



## Features:

- OCXO - Fixed Frequency
- 3.3V Operation
- LVCMOS
- Frequency Stability:  $\pm 20$ ppb
- Temperature Range: -40 to 85°C
- Low Phase Noise
- 14 Pin DIP Package
- RoHS Compliant / Lead Free

## Absolute Maximum Ratings

| Parameter            | Minimum | Nominal | Maximum | Units | Notes |
|----------------------|---------|---------|---------|-------|-------|
| Storage Temperature  | -55     | -       | 125     | °C    |       |
| Supply Voltage (Vcc) | -0.5    | -       | 4.5     | Vdc   |       |

## Operating Specifications

| Parameter                             | Minimum | Nominal         | Maximum | Units   | Notes |
|---------------------------------------|---------|-----------------|---------|---------|-------|
| Nominal Frequency (Fo)                |         | 20.0 and 24.576 |         | MHz     |       |
| Frequency Calibration                 | -0.3    | -               | 0.3     | ppm     | 1, 4  |
| Frequency Stability                   | -20     | -               | 20      | ppb     | 2     |
| Frequency vs Change in Supply Voltage | -10     | -               | 10      | ppb     | 3     |
| Aging Daily                           | -5      | -               | 5       | ppb     | 4     |
| Aging 1st Year                        | -0.3    | -               | 0.3     | ppm     |       |
| Total Frequency Tolerance (20 years)  | -1.5    | -               | 1.5     | ppm     | 5     |
| Operating Temperature Range           | -40     | -               | 85      | °C      |       |
| Supply Voltage (Vcc)                  | 3.13    | 3.3             | 3.47    | Vdc     |       |
| Supply Power (-40 to 85°C)            | -       | -               | 2.2     | Watts   |       |
| Phase Jitter (BW = 10KHz to Fo/2)     | -       | -               | 1       | ps RMS  |       |
| Period Jitter                         | -       | -               | 5       | ps RMS  |       |
| Allan Variance (1 second)             | -       | 5.0E-11         | -       |         |       |
| SSB Phase Noise at 10Hz offset        | -       | -100            | -       | dbc/Hz  | 6     |
| SSB Phase Noise at 100Hz offset       | -       | -120            | -       | dbc/Hz  | 6     |
| SSB Phase Noise at 1kHz offset        | -       | -140            | -       | dbc/Hz  | 6     |
| SSB Phase Noise at 10kHz offset       | -       | -150            | -       | dbc/Hz  | 6     |
| Start-Up Time Oscillator              | -       | -               | 35      | ms      |       |
| Warm-Up Time                          | -       | -               | 3       | Minutes | 7     |

## LVCMOS Output Characteristics

| Parameter                    | Minimum | Nominal | Maximum | Units | Notes |
|------------------------------|---------|---------|---------|-------|-------|
| Load                         | -       | 15      | -       | pF    |       |
| Voltage:                     |         |         |         |       |       |
| High (Voh)                   | 2.60    | -       | -       | Vdc   |       |
| Low (Vol)                    | -       | -       | 0.40    | Vdc   |       |
| Current                      |         |         |         |       |       |
| High (Ioh)                   | -4      | -       | -       | mA    |       |
| Low (Iol)                    | -       | -       | 4       | mA    |       |
| Duty Cycle at 50% of Vcc     | 45      | 50      | 55      | %     |       |
| Rise / Fall Time: 10% to 90% | -       | -       | 6.5     | ns    |       |

## Package Characteristics

OX400-Series DIP Package

14 Pin DIP Hermetically Sealed Grounded Welded Package

1. Initial calibration @ 25C.
2. Frequency stability vs. Change in temperature, referenced to 25C.
3. Frequency stability per 5% change in supply voltage.
4. At the time of shipment after 48 hours of operation.
5. Inclusive of calibration, operating temperature range, supply voltage change, shock and vibration 20 years aging.
6. Typical phase noise, results will vary depending on center frequency. The phase noise shown are typical for 20 MHz.
7. Measured @ 25C, within 3 minutes, the unit will be within +/-0.1ppm of its reference frequency, measured after 30 minutes of continuous operation at a stable 25C.





## 14 Pin DIP Package Environmental Characteristics

### ENVIRONMENTAL CHARACTERISTICS

Temperature Cycle: Per MIL-STD-883, Method 1010, Condition B. -55°C to 125°C, 300 cycles, 10 minute dwell, 1 minute transition.  
 Gross Leak Test: Per MIL-STD-202, Method 112, Condition D. No Bubbles in flourinert (FC-43) at 125°C ±5°C for 20 seconds

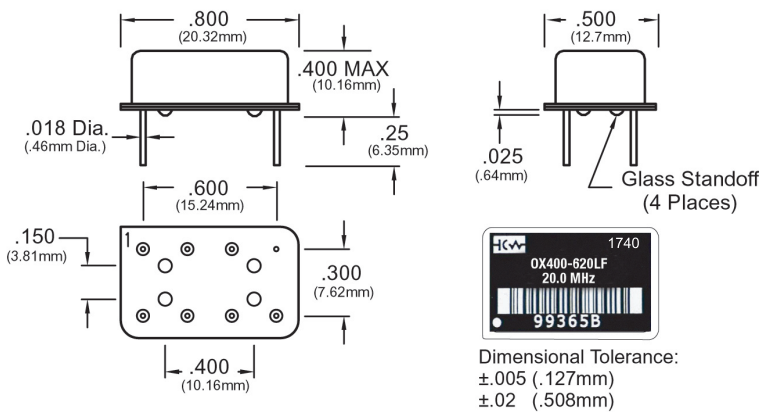
### SOLDERING

Pin Solderability: Per MIL-STD-883, Method 2003. 8 hour steam age prior to 254°C ±5°C Solder on dip, 95% Coverage.  
 Resistance to Solder Heat: Per MIL-STD-202, Method 210, Condition C. Wave: Topside board-mount product. 260°C ±5°C for 20 seconds

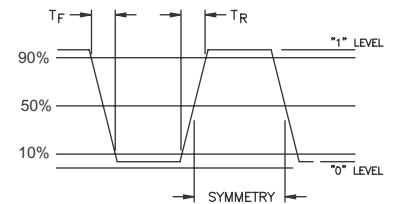
### MECHANICAL CHARACTERISTICS

Vibration: Per MIL-STD-202, Method 204, Condition A. 10G's peak, 10Hz to 500Hz, 15 minute cycles 12 times each perpendicular axis.  
 Shock: Per MIL-STD-202, Method 213, Condition F 1500G's, 0.5ms, half sine, 3 shocks per direction.  
 Moisture Resistance: Per MIL-STD-202, Method 106. 95% RH @ 65°C, 10 cycles 10°C to 65°C.

### 14 Pin DIP Package



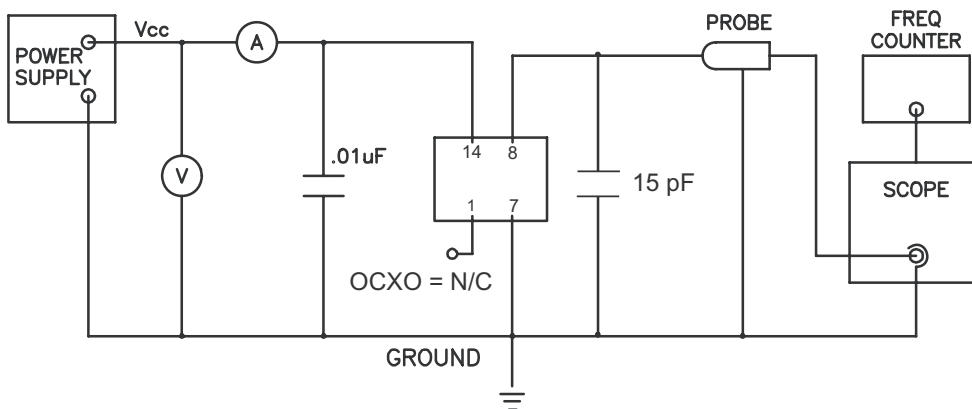
### CMOS Output Waveform



### Pin Connections

| Pin | Function      |
|-----|---------------|
| 1:  | N/C           |
| 7   | Ground (Case) |
| 8:  | Output        |
| 14: | Vcc           |

### Test Circuit



### Ordering Information

|                        |
|------------------------|
| OX400-620LF - 020.0M   |
| OX400-620LF - 024.576M |

|          |             |
|----------|-------------|
| Bulletin | Cx262       |
| Page     | 2 of 2      |
| Revision | 03          |
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