



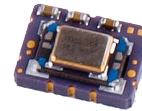
# 5x7mm Precision TCXO Model D75A



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## Description:

The Connor-Winfield's D75A is a 5x7mm Surface Mount Temperature Compensated Crystal Controlled Oscillator (TCXO) with a Tri-State LVCMOS output. Through the use of Analog Temperature Compensation, the D75A is capable of holding sub 1-ppm stabilities over the 0 to 70°C temperature range. The D75A meets STRATUM 3 requirements.



## Features:

✓ STRATUM 3

- 3.3 Vdc Operation
- LVCMOS Output
- Frequency Stability:  $\pm 0.28$  ppm
- Temperature Range: 0 to 70°C
- Low Jitter <1ps RMS
- Tri-State Enable/Disable Function
- 5x7mm Surface Mount Package
- Tape and Reel Packaging
- RoHS Compliant / Pb Free ✓ RoHS

## Applications:

- IEEE 1588 Applications
- Synchronous Ethernet slave clocks, ITU-T G.8262 EEC options 1 & 2
- Compliant to Stratum 3, GR-1244-CORE & GR-253-CORE
- Wireless Communications
- Small Cells
- Test and Measurement

## Absolute Maximum Ratings

| Parameter            | Minimum | Nominal | Maximum | Units   | Notes |
|----------------------|---------|---------|---------|---------|-------|
| Storage Temperature  | -55     | -       | 85      | °C      |       |
| Supply Voltage (Vcc) | -0.5    | -       | 6.0     | Vdc     |       |
| Input Voltage        |         | -0.5    | -       | Vcc+0.5 | Vdc   |

## Operating Specifications

| Parameter                           | Minimum | Nominal                   | Maximum | Units  | Notes       |
|-------------------------------------|---------|---------------------------|---------|--------|-------------|
| Nominal Frequency (Fo)              | -       | 10.0, 12.8, 19.2, or 20.0 | -       | MHz    |             |
| Frequency Calibration @ 25 °C       | -1.0    | -                         | 1.0     | ppm    | 1           |
| Frequency Stability vs. Temperature | -0.28   | -                         | 0.28    | ppm    | 2           |
| Holdover Stability (Over 24 Hours)  | -0.32   | -                         | 0.32    | ppm    | 3           |
| Frequency vs. Load Stability        | -0.05   | -                         | 0.05    | ppm    | $\pm 5\%$   |
| Frequency vs. Voltage Stability     | -0.05   | -                         | 0.05    | ppm    | $\pm 5\%$   |
| Static Temperature Hysteresis       | -       | -                         | 0.4     | ppm    | Absolute, 4 |
| Total Frequency Tolerance:          | -4.6    | -                         | 4.6     | ppm    | 5           |
| Operating Temperature Range:        | 0       | -                         | 70      | °C     |             |
| Supply Voltage (Vcc)                | 3.135   | 3.3                       | 3.465   | Vdc    | $\pm 5\%$   |
| Supply Current (Icc)                | -       | -                         | 6       | mA     |             |
| Period Jitter                       | -       | 3                         | 5       | ps rms |             |
| Integrated Phase Jitter             | -       | 0.5                       | 1.0     | ps rms | 6           |
| SSB Phase Noise (Fo = 10 MHz)       |         |                           |         |        |             |
| @10Hz offset                        | -       | -103                      | -       | dBc/Hz |             |
| @ 100Hz offset                      | -       | -128                      | -       | dBc/Hz |             |
| @ 1KHz offset                       | -       | -147                      | -       | dBc/Hz |             |
| @ 10KHz offset                      | -       | -157                      | -       | dBc/Hz |             |
| @ 100KHz offset                     | -       | -158                      | -       | dBc/Hz |             |
| Start-up Time                       | -       | -                         | 10      | ms     |             |

## Enable / Disable Input Characteristics (Pad 8)

| Parameter             | Minimum | Nominal | Maximum | Units | Notes |
|-----------------------|---------|---------|---------|-------|-------|
| Enable Voltage (High) | 70%Vcc  | -       | -       | Vdc   | 7     |
| Disable Voltage (Low) | -       | -       | 30%Vcc  | Vdc   | 7     |

## LVCMOS Output Characteristics

| Parameter                   | Minimum | Nominal | Maximum | Units | Notes |
|-----------------------------|---------|---------|---------|-------|-------|
| Load                        | -       | 15      | -       | pF    | 8     |
| Voltage (High) (Voh)        | 90%Vcc  | -       | -       | Vdc   |       |
| (Low) (Vol)                 | -       | -       | 10%Vcc  | Vdc   |       |
| Duty Cycle at 50% of Vcc    | 45      | 50      | 55      | %     |       |
| Rise / Fall Time 10% to 90% | -       | -       | 8       | ns    |       |

## Notes:

1. Initial calibration @ 25°C. Specifications at time of shipment after 48 hours of operation.
2. Frequency stability vs. change in temperature.  $\{ \pm (F_{max} - F_{min}) / (2 \cdot F_0) \}$ .
3. Inclusive of frequency stability, supply voltage change ( $\pm 1\%$ ), load change, aging, for 24 hours.
4. Frequency change after reciprocal temperature ramped over the operating range. Frequency measured before and after at 25°C.
5. Inclusive of calibration @ 25 C, frequency vs. change in temperature, change in supply voltage ( $\pm 5\%$ ), load change ( $\pm 5\%$ ), reflow soldering process and 20 years aging, referenced to Fo
6. BW = 12 KHz to 20 MHz.
7. Leave Pad 8 unconnected if enable / disable function is not required. When tri-stated, the output stage is disabled but the oscillator and compensation circuit are still active (current consumption < 1 mA).
8. For best performance it is recommended that the circuit connected to this output should have an equivalent input capacitance of 15pF.



## Package Characteristics

|                            |  |
|----------------------------|--|
| Package                    | Hermetically sealed crystal mounted on a ceramic package |
| Moisture Sensitivity Level | MSL-1  |

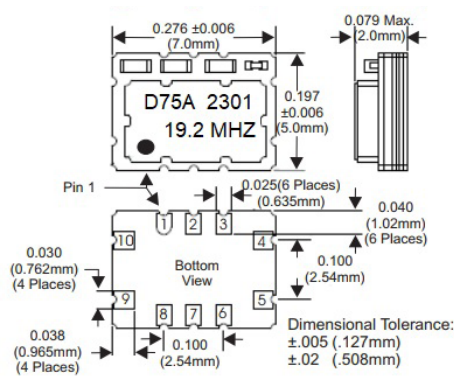
## Environmental Characteristics

|  |   |
|--|---|
| Vibration:   | Vibration per Mil Std 883E Method 2007.3 Test Condition A         |
| Shock:   | Mechanical Shock per Mil Std 883E Method 2002.4 Test Condition B. |
| Soldering Process;RoHS compliant lead free. See soldering profile on page 3. |   |

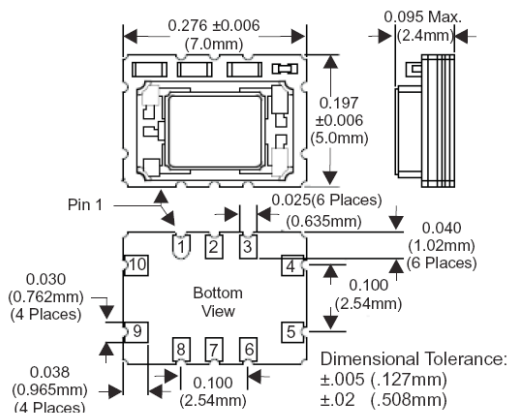
## Ordering Information

D75A-010.0M, D75A-012.8M, D75A-019.2M or D75A-020.0M

### Package Layout (5032 crystal) 19.2 MHz only



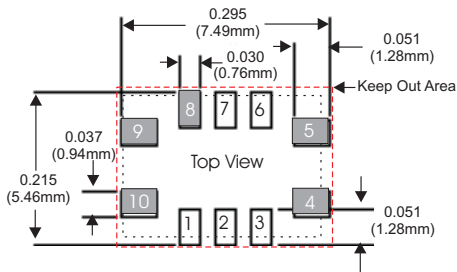
### Package Layout (3225 crystal)



### Pad Connections

- 1: Do Not Connect
- 2: Do Not Connect
- 3: Do Not Connect
- 4: Ground
- 5: Output
- 6: Do Not Connect
- 7: Do Not Connect
- 8: Tri-State Enable / Disable
- 9: Supply Voltage Vcc
- 10: N/C

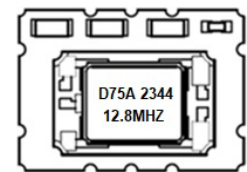
### Pad Layout



The pad layout applies to both package layouts above.

\* Do not route any traces in the keep out area. It is recommended the next layer under the keep out area is to be ground plane.

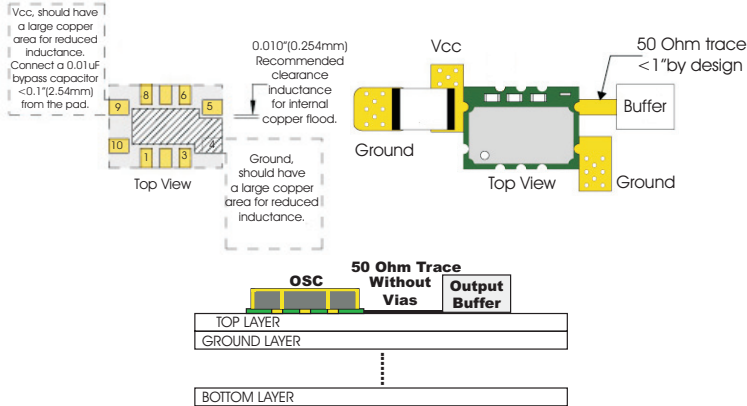
### Marking Information



|          |                    |
|----------|--------------------|
| Bulletin | <b>Tx236</b>       |
| Page     | <b>2 of 3</b>      |
| Revision | <b>05</b>          |
| Date     | <b>01 Nov 2023</b> |

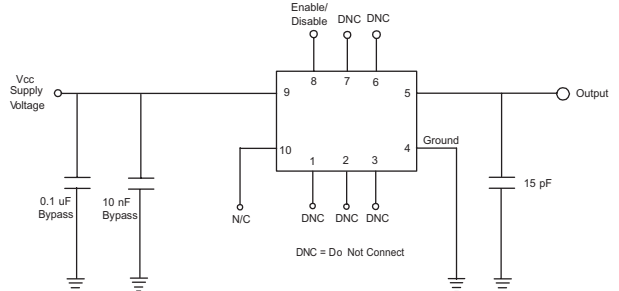


## Design Recommendations

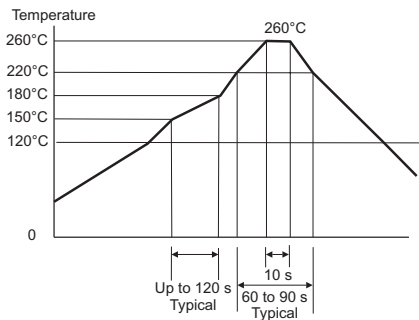


Attention: To achieve optimal frequency stability, and in some cases to meet the specification stated on this data sheet, it is required that the circuit connected to this TCXO output must have the equivalent input capacitance that is specified by the nominal load capacitance. Deviations from the nominal load capacitance will have a graduated effect on the stability of approximately 20 ppb per pF load difference.

## Test Circuit

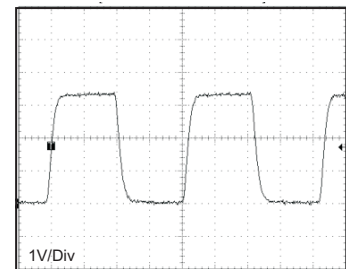


## Solder Profile



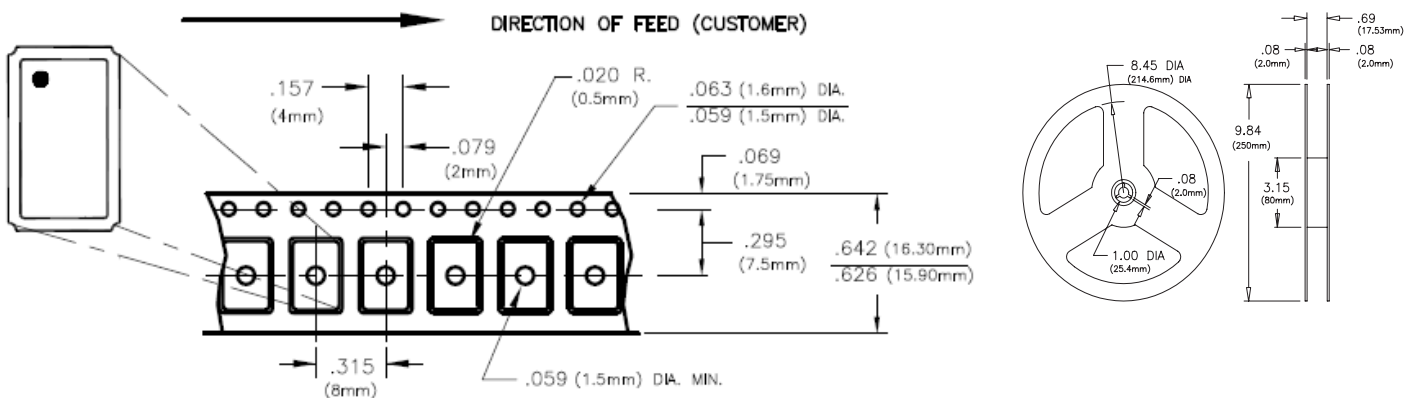
Meets IPC/JEDEC J-STD-020C

## Output Waveform



## Tape and Reel Dimensions

MEETS EIA-481A AND EIAJ-1009B  
 700 PCS/REEL MAXIMUM.



|          |             |
|----------|-------------|
| Bulletin | Tx236       |
| Page     | 3 of 3      |
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