

# 3.3V Surface Mount 5x7mm Stratum 3 HCMOS TCXO T501



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## TCXO

The Connor-Winfield T501 is a 5x7mm Surface Mount, Temperature Compensated Crystal Oscillator (TCXO). Operating at 3.3Vdc, the T501 will maintain  $\pm 4.6$ ppm frequency tolerance over 20 years. The T501 is offered for applications where small size and Stratum 3 performance are required.

### Features:

3.3V Operation  
Low Jitter <1 pS RMS  
Overall Frequency Tolerance:  
 $\pm 4.6$ ppm over 20 Years  
Hold Over Stability: 0.28ppm  
Temperature Range: 0 to 70°C  
Tri-State Enable / Disable  
Surface Mount Package  
Tape and Reel Packaging

### Absolute Maximum Ratings

Parameter	Minimum	Nominal	Maximum	Units	Notes
Storage Temperature	-55	-	125	°C	
Supply Voltage (Vcc)	-0.5	-	7.0	Vdc	
Enable / Disable Voltage	-0.5	-	7.0	Vdc	

### Operating Specifications

Parameter	Minimum	Nominal	Maximum	Units	Notes
Frequency Range (Fo)	12.8	-	20.0	MHz	
Supply Voltage (Vcc)	3.135	3.3	3.465	Vdc	
Supply Current (Icc)	-	-	6	mA	
Jitter: (BW=10 Hz to 20 MHz) (BW=12 kHz to 20 MHz)	-	-	5 1	ps RMS	
SSB Phase Noise at: 10 Hz offset 100 Hz offset 1 kHz offset $\geq 10$ kHz offset	-	-85 -110 -125 -135	-	dBc/Hz	

### Hold Over Stability

Parameter	Minimum	Nominal	Maximum	Units	Notes
Hold Over Stability $\pm([F_{max}-F_{min}]/2*F_o)$	-0.28	-	+0.28	ppm	
Temperature Range	0	-	70	°C	
Total Hold Over Stability	-0.32	-	+0.32	ppm	1

### Free Run Accuracy

Parameter	Minimum	Nominal	Maximum	Units	Notes
Total Frequency Tolerance	-4.6	-	+4.6	ppm	2
Temperature Range	0	-	70	°C	

### Input Characteristics

Parameter	Minimum	Nominal	Maximum	Units	Notes
Enable Voltage (High) or open circuit (Vih)	$\geq 0.6$	-	-	Vdc	3
Disable Voltage (Low) Output Tri-stated (Vil)	-	-	$\leq 0.2$	Vdc	

### HCMOS Output Characteristics

Parameter	Minimum	Nominal	Maximum	Units	Notes
Load	-	-	15	pf	
Voltage: High (Voh) Low (Vol)	$\geq 0.9 * V_{cc}$ -	-	- $\leq 0.1 * V_{cc}$	Vdc	
Duty Cycle at 50% of Vcc	45	50	55	%	
Rise / Fall Time 10% to 90%	-	-	9	nS	

### Notes:

- Inclusive of Hold Over stability, supply voltage change ( $\pm 5\%$ ), aging, 24 hours
- 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.
- 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  $\leq 1$  mA).

### Ordering Information

T501 - 20.00 MHz

TCXO SERIES CENTER FREQUENCY

US Headquarters:  
630-851-4722  
European Headquarters:  
+353-61-472221

Bulletin **Tx100**  
Page **1 of 2**  
Revision **02**  
Date **05 Nov 2003**



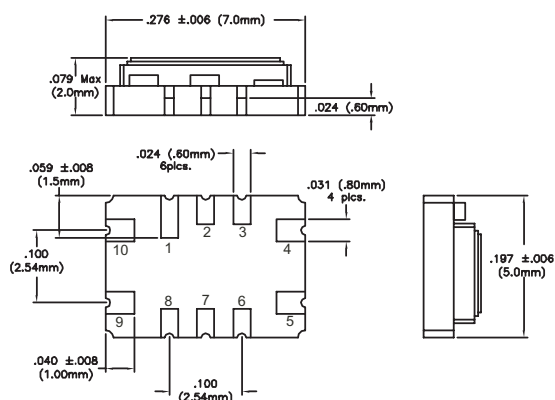
## Package Characteristics

Package Ceramic Surface Mount Package

## Environmental Characteristics

Vibration	IEC 60068-2-6 Test Fc Procedure B4, 10-60 Hz 1.5mm displacement, at 98.1 ms <sup>-2</sup> , 30 minutes in each mutually perpendicular axes at 1 octave per minute.
Shock	IEC 60068-2-27 Test Ea, 980ms <sup>-2</sup> acceleration for 6ms duration, 3 shocks in each direction along three mutually perpendicular.
Soldering	SMD product suitable for Convection Reflow soldering. Peak temperature 260°C Maximum time above 220°C, 60 seconds.
Solderability:	MIL-STD-202, Method 208, Category 3

### PACKAGE DRAWING

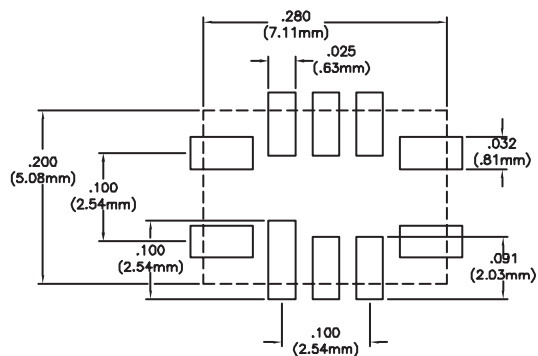


### Pin Function

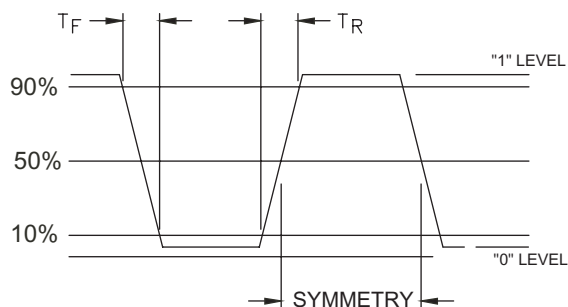
- 1 Do not connect
- 2 N/C
- 3 Do not connect
- 4 Ground
- 5 Output
- 6 N/C
- 7 N/C
- 8 Tri-state Control
- 9 Supply, Vcc
- 10 Do not connect, Or connect to Ground

Dimensional Tolerance: ±.005 (.127mm)

### SUGGESTED PAD LAYOUT



### OUTPUT WAVEFORM



### TEST CIRCUIT

