Ultra Precise TCXO / VCTCXO

CONNOR WINFIELD

2111 Comprehensive Drive

Aurora, Illinois 60505

Phone: 630-851-4722

Fax: 630-851-5040

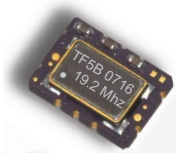
www.conwin.com

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

Description

The Connor Winfieldl Tx5B-series are miniature 5x7mm Surface Mount Temperature Compensated Crystal Oscillator (TCXO) or Voltage Controlled Temperature Compensated Crystal Oscillator (VCTCXO) with a Clipped Sinewave output. Through the use of Analog Temperature Compensation, the Tx5B-series are capable of holding sub 0.1-ppm stabilities over the commercial temperature range. Recommended for STRATUM 3 applications

Features



TCXO Models:
TB5B - TD5B
VCTCXO Models:
TF5B - TH5B

3.3V or 5.0V Operation
Clipped Sinewave Output Logic
Frequency Stability: +/-0.10ppm
Temperature Range: 0 to 70°C
Frequency Tolerance: +/-4.6ppm for 10 yrs.
Low Jitter <1pS RMS
Tri-State Enable/Disable Function
5x7mm Surface Mount Package
Tape and Reel Packaging
RoHS Compliant / Lead Free ✓RoHS

Specifications

ABSOLUTE MAXIMUM RATINGS — TABLE 1

PARAMETER	UNITS	MINIMUM	NOMINAL	MAXIMUM	UNITS	NOTE
Storage Temperature		-55	-	125	°C	
Supply Voltage	(Vcc)	-0.5	-	6.0	Vdc	
Input Voltage	(Vc)	-0.5	-	Vcc+0.5	Vdc	

OPERATING SPECIFICATIONS — TABLE 2

PARAMETER			MINIMUM	NOMINAL	MAXIMUM	UNITS	NOTE
Frequency Range			6.4	-	26.0	MHz	
Frequency Calibration	(TCXO Models)		-1.00	-	1.00	ppm	
Frequency Stability			-0.10	-	0.10	ppm	1
Operating Temperature Range			0	-	70	°C	
Aging First Year			-1.0	-	1.0	ppm	
Supply Voltage Variation. (Vcc±5%)			-0.025	-	0.025	ppm	
Load Coefficient, ±5pF			-0.025	-	0.025	ppm	
Frequency shift after reflow soldering			-1.00	-	1.00	ppm	
Total Frequency Tolerance			-4.6	-	4.6	ppm	2
Supply Voltage	Models TB5B and TF5B	(Vcc)	3.135	3.3	3.465	Vdc	3
	Models TD5B and TH5B	(Vcc)	4.75	5.0	5.25	Vdc	3
Supply Current		(Icc)	-	6	10	mA	
Jitter (BW=10Hz to 20MHz)			-	-	5	ps rms	
Jitter (BW=12kHz to 20MHz)			-	-	1	ps rms	
SSB Phase Noise at 10Hz offset			-	-	-80	dBc/Hz	
SSB Phase Noise at 100Hz offset			-	-	-110	dBc/Hz	
SSB Phase Noise at 1KHz offset			-	-	-135	dBc/Hz	
SSB Phase Noise at ≥10KHz offset			-	-	-150	dBc/Hz	
Startup Time			-	-	10	ms	

INPUT CHARACTERISTICS for VOLTAGE CONTROL (Pad 10) — TABLE 3

PARAMETER		MINIMUM	NOMINAL	MAXIMUM	UNITS	Notes
Control Voltage Range (Vcc = 3.3V)	(Vc)	0.3	1.65	3.0	Vdc	
Frequency Tuning		±10	-	-	ppm	
Input Impedance		100K	-	-	Ohms	
Linearity		±5	-	-	%	
Slope		Positive				

INPUT CHARACTERISTICS for ENABLE / DISABLE FUNCTION (Pad 8) — TABLE 3

PARAMETER		MINIMUM	NOMINAL	MAXIMUM	UNITS	NOTE
Enable Voltage (High) or open circuit	(Vih)	70% Vdd	-	-	Vdc	4
Disable Voltage (Low) Output Tri-stated	(Vil)	-	-	30% Vdd	Vdc	

CLIPPED SINEWAVE OUTPUT CHARACTERISTICS (Pad 5) — TABLE 4

PARAMETER	MINIMUM	NOMINAL	MAXIMUM	UNITS	Notes
Load	-	10KOhm//10pF	-		5
Output Voltage	1.00	-	-	V pk-pk	

RoHS COMPLIANT

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PACKAGE CHARACTERISTICS — TABLE 5

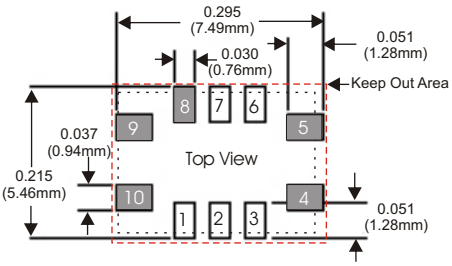
Package	Ceramic Surface Mount Package.

ENVIRONMENTALS — TABLE 6

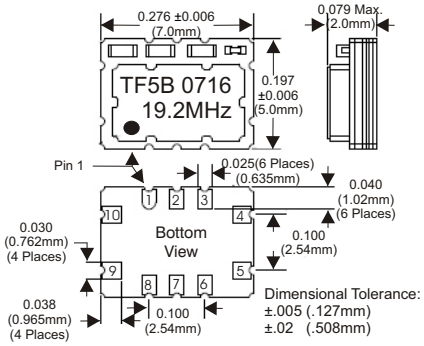
Vibration:	Vibration per Mil Std 883E Method 2007.3 Test Condition A
Shock:	Mechanical Shock per Mil Std 883E Method 2002.4 Test Condition B.
Soldering:	See solder profile page.
Solderability	Solderability per Mil Std 883E Method 2003

Note:
1) Frequency stability vs. change in temperature. [±(Fmax – Fmin)/2.Fo].
2) Inclusive of calibration @ 25°C, frequency vs. change in temperature, change in supply voltage (±5%), load change (±5%), reflow soldering process and 10 years aging
3) For best in application performance, careful selection of an external power source is critical. Select an external regulator that meets or exceeds to following specifications regarding voltage regulation tolerance, initial accuracy, temperature coefficient, voltage noise, and low voltage noise density. **Factory Test Conditions:** Initial Accuracy ±2mv, Noise (0.1Hz to 10 KHz) 15uV p-p, Voltage Noise Density = 50nV/sqrt Hz, Temperature Coefficient < 5ppm/°C.
4) 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).
5) Output is AC coupled

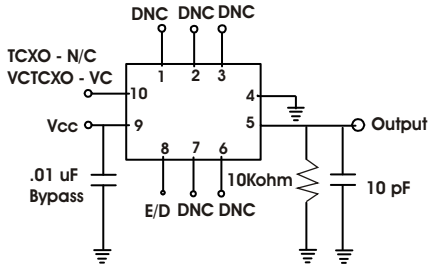
Suggested Pad Layout



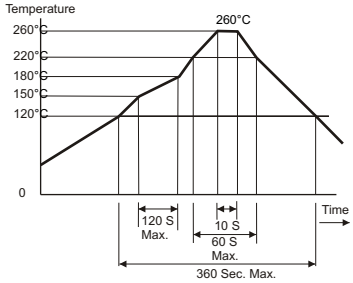
Package Layout



Test Circuit



Solder Profile

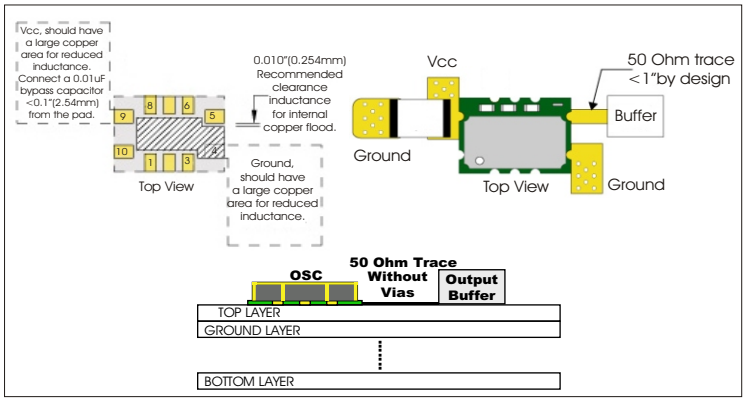


Pad Connections

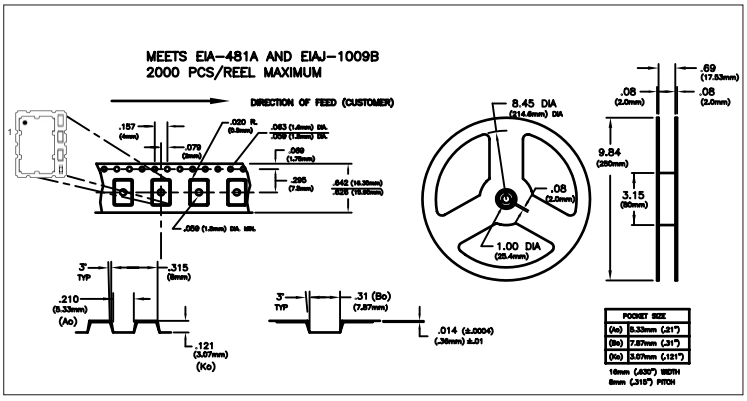
TABLE 7

Pad	Connection
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, Vcc
10	Voltage Control (VC) or N/C

Design Recommendations



Tape and Reel Information



Ordering Information

T	F	5	B	-	019.2M
Type: Precision TCXO VCTCXO 5x7mm	Features: B = TCXO, Clipped Sinewave, 3.3Vdc. D = TCXO, Clipped Sinewave, 5.0Vdc. F = VCTCXO, Clipped Sinewave, 3.3Vdc. H = VCTCXO, Clipped Sinewave, 5.0Vdc.	Temperature Range: 5 = 0 to 70° C	Frequency Stability: B = ± 0.10 ppm		Output Frequency: M = MHz xxx.xM

Example Part Number: TF5B-019.2M

US Headquarters:
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European Headquarters:
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