

Ultra-Miniature Precision TCXO / VCTCXO



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Description

The Connor-Winfield 2.5x3.2mm Temperature Compensated Crystal Oscillators and Voltage Controlled Temperature Compensated Crystal Oscillators are designed for use in GPS applications requiring tight frequency stability over the -30 to 85°C temperature range. Through the use of Analog Temperature Compensation, this device is capable of holding sub 1-ppm stabilities over the wide temperature range.



Features:

Model: Cxx - Series

2.5V or 3.3V Operation
Clipped Sinewave Output Logic
Ultra-Miniature 2.5x3.2mm SMT Package
Frequency Stabilities Available:
 $\pm 0.50\text{ppm}$, $\pm 1.00\text{ppm}$,
 $\pm 1.50\text{ppm}$, $\pm 2.00\text{ppm}$
Temperature Ranges Available: -30 to 85°C
Low Power <2mA
Low Jitter <1pS RMS
Tape and Reel Packaging
RoHS Compliant / Lead Free

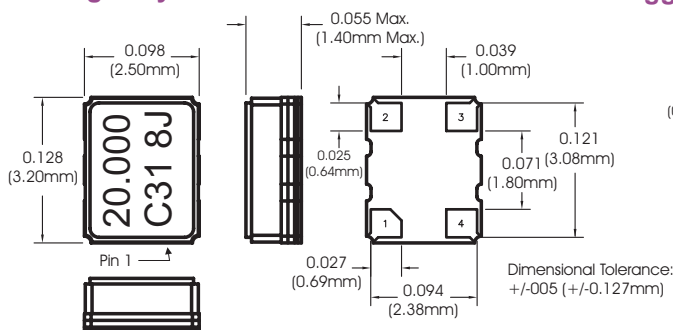
Applications

GPS Receivers

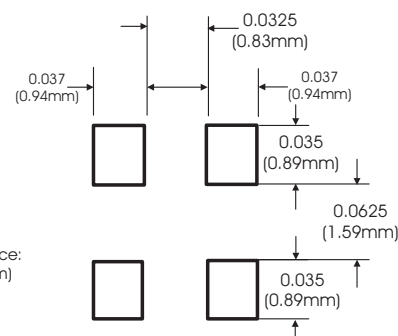
Pad Connections

Pad	Connection
1	Voltage Control (VCTCXO) N/C (TCXO)
2	Ground
3	Output
4	Supply, Vcc

Package Layout



Suggested Pad Layout



Ordering Information

C	3	1	020.0M
Type: Precision TCXO VCTCXO 2.5x3.2mm Package	Features: 1 = TCXO, 2.5Vdc, -30 to 85° C 2 = VCTCXO, 2.5Vdc, -30 to 85° C 3 = TCXO, 3.3Vdc, -30 to 85° C 4 = VCTCXO, 3.3Vdc, -30 to 85° C	Frequency Stability: 1 = ± 0.50 ppm 2 = ± 1.00 ppm 3 = ± 1.50 ppm 4 = ± 2.00 ppm	Output Frequency: Frequency Format -xxx.xM Min.* -xxx.xxxxxM Max.* *Amount of numbers after the decimal point. M = MHz

Example Part Number:

C31-020.0M = 2.5x3.2mm, TCXO, Clipped Sinewave,
3.3Vdc, 0 to 70C, +/-0.50ppm, Output Frequency 20.0MHz

Please consult the factory for available frequencies.



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Revision **P03**
Date **24 Sep 2008**



Model Specifications

Model Number	C11	C31	C21	C42	Note
TCXO / VCTCXO	TCXO	TCXO	VCTCXO	VCTCXO	
Supply Voltage	2.5Vdc	3.3Vdc	2.5Vdc	3.3Vdc	
Frequency Stability	± 0.50 ppm				1
Temperature Range	-30 to 85°C				
Model Number	C12	C32	C22	C42	Note
TCXO / VCTCXO	TCXO	TCXO	VCTCXO	VCTCXO	
Supply Voltage	2.5Vdc	3.3Vdc	2.5Vdc	3.3Vdc	
Frequency Stability	± 1.00 ppm				1
Temperature Range	-30 to 85°C				
Model Number	C13	C33	C23	C43	Note
TCXO / VCTCXO	TCXO	TCXO	VCTCXO	VCTCXO	
Supply Voltage	2.5Vdc	3.3Vdc	2.5Vdc	3.3Vdc	
Frequency Stability	± 1.50 ppm				1
Temperature Range	-30 to 85°C				
Model Number	C14	C34	C24	C44	Note
TCXO / VCTCXO	TCXO	TCXO	VCTCXO	VCTCXO	
Supply Voltage	2.5Vdc	3.3Vdc	2.5Vdc	3.3Vdc	
Frequency Stability	± 2.00 ppm				1
Temperature Range	-30 to 85°C				

Note: 1) Frequency stability vs. change in temperature. $[\pm (F_{max} - F_{min})/2.F_0]$.

Electrical Specifications for all Models

Absolute Maximum Ratings

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

Parameter	Minimum	Nominal	Maximum	Units	Note
Frequency Range	10	-	40	MHz	
Frequency Calibration (TCXO Models)	-1.00	-	1.00	ppm	
Aging per Year	-1.00	-	1.00	ppm	
Supply Voltage Variation. (Vcc $\pm 5\%$)	-0.025	-	0.025	ppm	
Load Coefficient, $\pm 5\%$	-0.025	-	0.025	ppm	
Static Temperature Hysteresis	-0.4	-	0.4	ppm	2
Frequency shift after reflow soldering	-1.00	-	1.00	ppm	
Supply Voltage	2.5v Models (Vcc)	2.375	2.500	2.625	Vdc
	3.3v Models (Vcc)	3.135	3.300	3.465	Vdc
Supply Current	(Icc)	-	-	2	mA
Period Jitter	-	3	5	ps rms	
Phase Jitter (BW=12kHz to 20MHz)	-	0.5	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	-	-130	-	dBc/Hz	
SSB Phase Noise at ≥ 10 KHz offset	-	-145	-	dBc/Hz	

Input Characteristics

Parameter	Minimum	Nominal	Maximum	Units	Notes
Control Voltage Range	2.5v Models (Vc)	0.2	1.2	2.2	Vdc
	3.3v Models (Vc)	0.5	1.5	2.5	
Frequency Tuning	± 10	-	-	ppm	
Linearity	± 5	-	-	%	
Slope	Positive				

Clipped Sinewave Output Characteristics

Parameter	Minimum	Nominal	Maximum	Units	Notes
Load	-	10KOhm/10pF	-		
Output Voltage	1.00	-	-	V pk-pk	DC Coupled

Package Characteristics

Package	Ceramic Surface Mount Package.
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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:	See solder profile.
Solderability	Solderability per Mil Std 883E Method 2003

2) Frequency change after reciprocal temperature ramped over the operating range. Frequency measured before and after at 25°C.

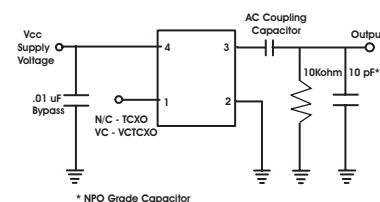
Specifications subject to change without notice. All dimensions in inches. © Copyright 2008 The Connor-Winfield Corporation

Features

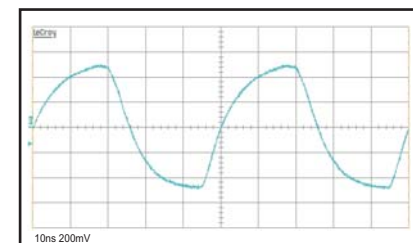
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Recommended for new designs

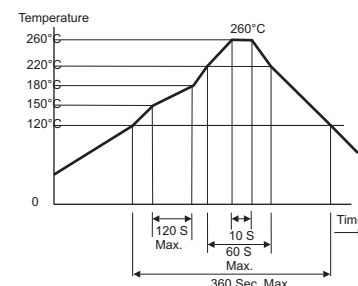
Test Circuit



Output Waveform



Solder Profile



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