

5.0x7.0mm Surface Mount Package Txxx CMOS Series



2111 Comprehensive Drive

Aurora, Illinois 60505

Phone: 630-851-4722

Fax: 630-851-5040

www.conwin.com

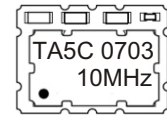
US Headquarters

630-851-4722:

European Headquarters:

+353-61-472221

TCXO / VCTCXO 3.3V / 5.0V Series LVCMOS / HCMOS Series



Description
The Connor-Winfield 5.0x7.0mm Temperature Compensated Crystal Controlled Oscillators (TCXO series) and Voltage Controlled Temperature Compensated Crystal Controlled Oscillators (VCTCXO series) are designed for use in applications requiring tight frequency stability. Through the use of Analog Temperature Compensation, this device is capable of holding sub 1-ppm stabilities over the commercial or the industrial temperature ranges.

Features
TCXO or VCTCXO
3.3V or 5.0V Operation
LVCMOS or HCMOS Output Logic
Frequency Stabilities Available:
Tx5C - Series: ± 0.10 ppm
Tx5D / Tx6D - Series: ± 0.25 ppm
Tx5E / Tx6E - Series: ± 0.50 ppm
Tx5F / Tx6F - Series: ± 1.00 ppm
Temperature Ranges Available:
Tx5x Series: 0 to 70°C
Tx6x Series: -40 to 85°C
Low Jitter < 1pS RMS
Tri-State Enable/Disable
Surface Mount Package
Tape and Reel Packing
RoHS Compliant

Standard Model Numbers Available

Model Number	Frequency Range	Frequency Stability	Temperature Range	TCXO VCTCXO	Supply Voltage	TABLE 1.1 Tables on Page 2
TA5C	6.4 to 20 MHz	± 0.10 ppm	0 to 70°C	TCXO	3.3V	1.2
TC5C	6.4 to 20 MHz	± 0.10 ppm	0 to 70°C	TCXO	5.0V	1.2
TE5C	6.4 to 20 MHz	± 0.10 ppm	0 to 70°C	VCTCXO	3.3V	1.2
TG5C	6.4 to 20 MHz	± 0.10 ppm	0 to 70°C	VCTCXO	5.0V	1.2
TA5D	6.4 to 27 MHz	± 0.25 ppm	0 to 70°C	TCXO	3.3V	2.2
TC5D	6.4 to 27 MHz	± 0.25 ppm	0 to 70°C	TCXO	5.0V	2.2
TA6D	6.4 to 27 MHz	± 0.25 ppm	-40 to 85°C	TCXO	3.3V	2.2
TC6D	6.4 to 27 MHz	± 0.25 ppm	-40 to 85°C	TCXO	5.0V	2.2
TE5D	6.4 to 27 MHz	± 0.25 ppm	0 to 70°C	VCTCXO	3.3V	2.2
TG5D	6.4 to 27 MHz	± 0.25 ppm	0 to 70°C	VCTCXO	5.0V	2.2
TE6D	6.4 to 27 MHz	± 0.25 ppm	-40 to 85°C	VCTCXO	3.3V	2.2
TG6D	6.4 to 27 MHz	± 0.25 ppm	-40 to 85°C	VCTCXO	5.0V	2.2
TA5E	6.4 to 40 MHz	± 0.50 ppm	0 to 70°C	TCXO	3.3V	3.2
TC5E	6.4 to 40 MHz	± 0.50 ppm	0 to 70°C	TCXO	5.0V	3.2
TA6E	6.4 to 40 MHz	± 0.50 ppm	-40 to 85°C	TCXO	3.3V	3.2
TC6E	6.4 to 40 MHz	± 0.50 ppm	-40 to 85°C	TCXO	5.0V	3.2
TE5E	6.4 to 40 MHz	± 0.50 ppm	0 to 70°C	VCTCXO	3.3V	3.2
TG5E	6.4 to 40 MHz	± 0.50 ppm	0 to 70°C	VCTCXO	5.0V	3.2
TE6E	6.4 to 40 MHz	± 0.50 ppm	-40 to 85°C	VCTCXO	3.3V	3.2
TG6E	6.4 to 40 MHz	± 0.50 ppm	-40 to 85°C	VCTCXO	5.0V	3.2
TA5F	6.4 to 52 MHz	± 1.00 ppm	0 to 70°C	TCXO	3.3V	4.2
TC5F	6.4 to 52 MHz	± 1.00 ppm	0 to 70°C	TCXO	5.0V	4.2
TA6F	6.4 to 52 MHz	± 1.00 ppm	-40 to 85°C	TCXO	3.3V	4.2
TC6F	6.4 to 52 MHz	± 1.00 ppm	-40 to 85°C	TCXO	5.0V	4.2
TE5F	6.4 to 52 MHz	± 1.00 ppm	0 to 70°C	VCTCXO	3.3V	4.2
TG5F	6.4 to 52 MHz	± 1.00 ppm	0 to 70°C	VCTCXO	5.0V	4.2
TE6F	6.4 to 52 MHz	± 1.00 ppm	-40 to 85°C	VCTCXO	3.3V	4.2
TG6F	6.4 to 52 MHz	± 1.00 ppm	-40 to 85°C	VCTCXO	5.0V	4.2

Standard Frequencies Available *

TABLE 2.1

6.4 MHz	9.72 MHz	10 MHz
12.8 MHz	19.44 MHz	20 MHz

*Available from the factory for small quantities or quick deliveries, additional frequencies are available.

Specifications subject to change without notice. All dimensions in inches. © Copyright 1998 The Connor-Winfield Corporation



Bulletin Tx180

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Revision 02

Date 08 Feb 2007

Model Specifications

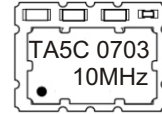


TABLE 1.2

Model Number	TA5C	TC5C	TE5C	TG5C	Note:
Frequency Range	6.4 to 20 MHz				
Frequency Stability	±0.10ppm				1.2
Temperature Range	0 to 70°C				
Supply Voltage	3.3 Vdc	5.0 Vdc	3.3 Vdc	5.0 Vdc	
TCXO / VCTCXO	TCXO	TCXO	VCTCXO	VCTCXO	

TABLE 2.2

Model Number	TA5D	TC5D	TE5D	TG5D	Note:
Frequency Range	6.4 to 27 MHz				
Frequency Stability	±0.25ppm				1.2
Temperature Range	0 to 70°C				
Supply Voltage	3.3 Vdc	5.0 Vdc	3.3 Vdc	5.0 Vdc	
TCXO / VCTCXO	TCXO	TCXO	VCTCXO	VCTCXO	

Model Number	TA6D	TC6D	TE6D	TG6D	Note:
Frequency Range	6.4 to 27 MHz				
Frequency Stability	±0.25ppm				1.2
Temperature Range	-40 to 85°C				
Supply Voltage	3.3 Vdc	5.0 Vdc	3.3 Vdc	5.0 Vdc	
TCXO / VCTCXO	TCXO	TCXO	VCTCXO	VCTCXO	

TABLE 3.2

Model Number	TA5E	TC5E	TE5E	TG5E	Note:
Frequency Range	6.4 to 40 MHz				
Frequency Stability	±0.50ppm				1.2
Temperature Range	0 to 70°C				
Supply Voltage	3.3 Vdc	5.0 Vdc	3.3 Vdc	5.0 Vdc	
TCXO / VCTCXO	TCXO	TCXO	VCTCXO	VCTCXO	

Model Number	TA6E	TC6E	TE6E	TG6E	Note:
Frequency Range	6.4 to 40 MHz				
Frequency Stability	±0.50ppm				1.2
Temperature Range	-40 to 85°C				
Supply Voltage	3.3 Vdc	5.0 Vdc	3.3 Vdc	5.0 Vdc	
TCXO / VCTCXO	TCXO	TCXO	VCTCXO	VCTCXO	

TABLE 4.2

Model Number	TA5F	TC5F	TE5F	TG5F	Note:
Frequency Range	6.4 to 52 MHz				
Frequency Stability	±1.00ppm				1.2
Temperature Range	0 to 70°C				
Supply Voltage	3.3 Vdc	5.0 Vdc	3.3 Vdc	5.0 Vdc	
TCXO / VCTCXO	TCXO	TCXO	VCTCXO	VCTCXO	

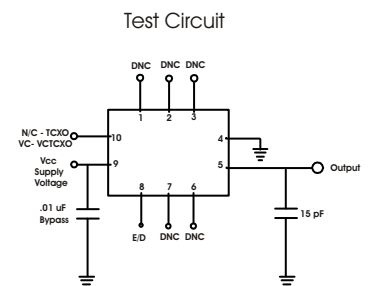
Model Number	TA6F	TC6F	TE6F	TG6F	Note:
Frequency Range	6.4 to 52 MHz				
Frequency Stability	±1.00ppm				1.2
Temperature Range	-40 to 85°C				
Supply Voltage	3.3 Vdc	5.0 Vdc	3.3 Vdc	5.0 Vdc	
TCXO / VCTCXO	TCXO	TCXO	VCTCXO	VCTCXO	

Features

- TCXO
- VCTCXO
- 3.3V Operation or 5.0V Operation
- LVC MOS Output
- Frequency Stability:
 - TxxC-Series ±0.10ppm
 - TxxD-Series ±0.25ppm
 - TxxE-Series ±0.50ppm
 - TxxF-Series ±1.00ppm
- Temperature Range:
 - Tx5x-Series 0 to 70°C
 - Tx6x-Series -40 to 85°C
- Low Jitter < 1pS RMS
- Tri-State Enable/Disable
- Surface Mount Package
- Tape and Reel Packing
- RoHS Compliant / Lead Free

Pin Connections

Pin	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 (VCTCXO) N/C (TCXO)



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ORDERING INFORMATION

TA5C - 10 MHz
TCXO SERIES CENTER FREQUENCY

Electrical Specifications for all Models

ABSOLUTE MAXIMUM RATINGS

TABLE 3.1

PARAMETER	UNITS	MINIMUM	NOMINAL	MAXIMUM	UNITS	NOTE
Storage Temperature		-55	-	125	°C	
Supply Voltage	(Vcc)	-0.5	-	6.0	Vdc	
Input Voltage		-0.5	-	Vcc+0.6	Vdc	

OPERATING SPECIFICATIONS

TABLE 2.3

PARAMETER	MINIMUM	NOMINAL	MAXIMUM	UNITS	NOTE
TCXO Frequency Calibration @ 25 C	-1.00	-	1.00	ppm	1.3
Aging First Year	-1.00	-	1.00	ppm	
Aging Per Year	-1.00	-	1.00	ppm	
Supply Voltage Variation. (Vcc±5%)	-0.2	-	0.2	ppm	
Load Coefficient, ±5pF	-0.2	-	0.2	ppm	
Supply Voltage	3.3Vdc (Vcc)	3.135	3.3	3.465	Vdc
	5.0Vdc (Vcc)	4.75	5.0	5.25	Vdc
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	-70	dBc/Hz	
SSB Phase Noise at 100Hz offset	-	-110	-100	dBc/Hz	
SSB Phase Noise at 1KHz offset	-	-135	-130	dBc/Hz	
SSB Phase Noise at >10KHz offset	-	-150	-145	dBc/Hz	
SSB Phase Noise at >100KHz offset	-	-150	-150	dBc/Hz	

INPUT CHARACTERISTICS for ENABLE / DISABLE FUNCTION (Pin 8)

TABLE 3.3

PARAMETER	MINIMUM	NOMINAL	MAXIMUM	UNITS	NOTE
Enable Voltage (High) or open circuit	(Vih)	70% Vdd	-	-	Vdc 2.3
Disable Voltage (Low) Output Tri-stated	(Vil)	-	-	30% Vdd	Vdc

VCTCXO INPUT CHARACTERISTICS for VOLTAGE CONTROL (Pin10)

TABLE 4.3

PARAMETER	MINIMUM	NOMINAL	MAXIMUM	UNITS	NOTE
Control Voltage Range (Vcc = 3.3V)	(Vc)	0.3	1.65	3.0	Vdc
Control Voltage Range (Vcc = 5.0V)	(Vc)	0.5	2.5	4.5	Vdc
Frequency Tuning		±10	-	-	ppm 3.3
Linearity		±5	-	-	%
Slope		Positive			

CMOS OUTPUT CHARACTERISTICS

TABLE 5.3

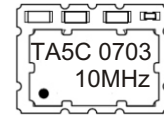
PARAMETER	MINIMUM	NOMINAL	MAXIMUM	UNITS	NOTE
LOAD	-	-	15	pF	
Voltage (High)	(Voh)	90%Vcc	-	-	Vdc
(Low)	(Vol)	-	-	10%Vcc	Vdc
Current (High)	(Ioh)	-4	-	-	mA
(Low)	(Iol)	-	-	4	mA
Duty Cycle at 50% of Vcc		45	50	55	%
Rise / Fall Time 10% to 90%		-	-	8	ns

Notes:

- 1.3) TCXO: Initial calibration @ 25 C. Specifications at time of shipment after 48 hours of operation.
- 2.3) 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).
- 3.3) Additional pull ranges are available; please contact the factory for additional information.

ORDERING INFORMATION

TA5C - 10 MHz
 TCXO SERIES CENTER FREQUENCY



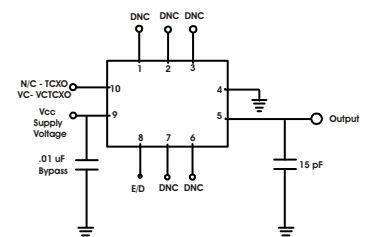
Features

TCXO
 VCTCXO
 3.3V Operation or
 5.0V Operation
 LVCMOS Output
 Frequency Stability:
 TxxC-Series ±0.10ppm
 TxxD-Series ±0.25ppm
 TxxE-Series ±0.50ppm
 TxxF-Series ±1.00ppm
 Temperature Range:
 Tx5x-Series 0 to 70°C
 Tx6x-Series -40 to 85°C
 Low Jitter < 1ps RMS
 Tri-State Enable/Disable
 Surface Mount Package
 Tape and Reel Packing
 RoHS Compliant / Lead Free

Pin Connections

Pin	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 (VCTCXO) N/C (TCXO)

Test Circuit



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PACKAGE CHARACTERISTICS

TABLE 1.4

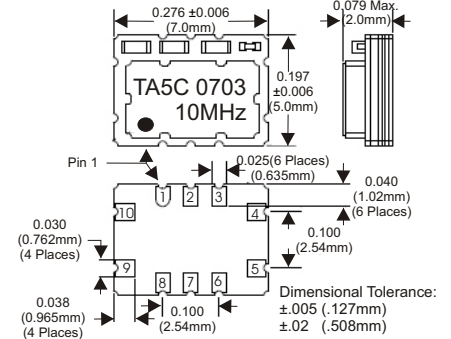
Package	Ceramic Surface Mount Package.
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Environmental

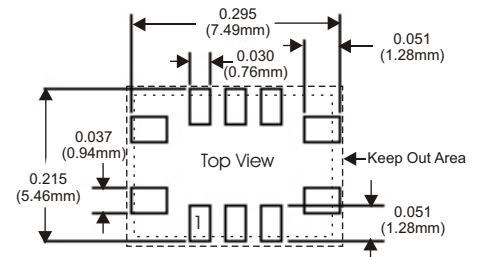
TABLE 2.4

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:	SMD product suitable for Convection Reflow soldering. Peak temperature 260 C. Maximum time above 220 C, 60 seconds.
Solderability	Solderability per Mil Std 883E Method 2003

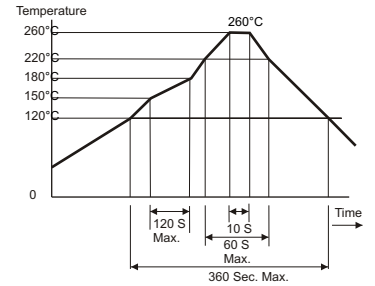
PACKAGE DRAWING



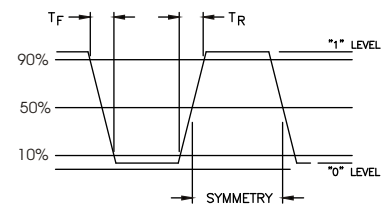
SUGGESTED PAD LAYOUT



SOLDER PROFILE

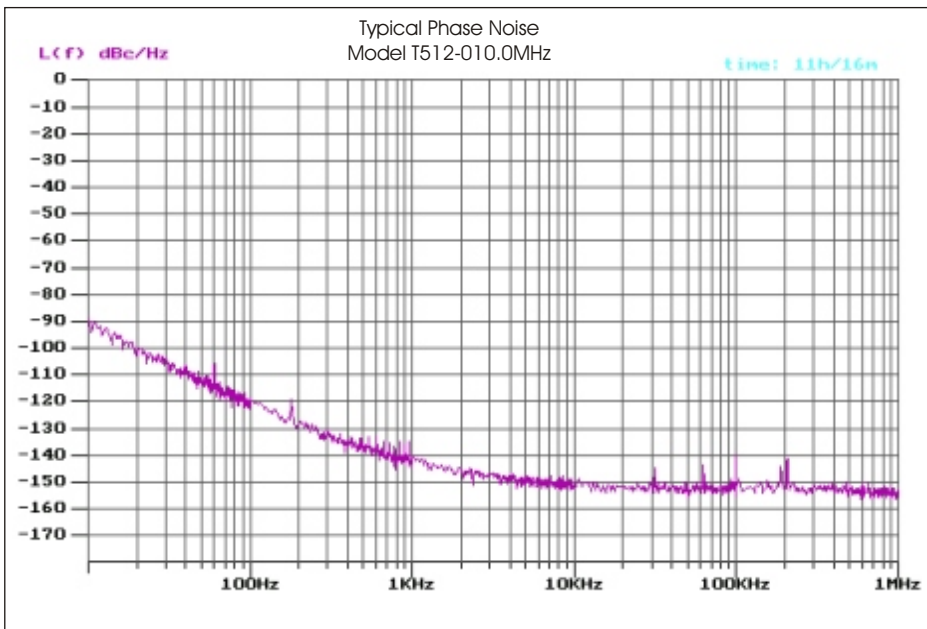


OUTPUT WAVEFORM



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Tape and Reel Information

MEETS EIA-481A AND EIAJ-1009B
2000 PCS/REEL MAXIMUM

