Available at Digi-Key

5x3.2mm Precision TCXO Model M602A

CONNOR WINFIELD

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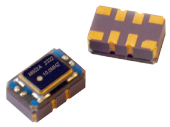
Description:



The Connor-Winfield M602A is a 5x3.2mm, 3.3V LVCMOS, Surface Mount, Temperature Compensated Crystal Oscillator (TCXO) designed for applications requiring ±0.28ppm frequency stability over an extended temperature range of -40 to 105°C

Features:

- Package: 5 x 3.2mm, 8 Pads
- 3.3 Vdc Operation
- Output Logic: LVCMOS
- Frequency Stability: ±0.28ppm -40 to 105°C
- Fixed Frequency - TCXO
- Low Jitter <0.50 ps RMS
- Low Phase Noise
- Tape and Reel Packaging
- RoHS Compliant / Lead Free ✓RoHS

Applications:

Basestation	Communications
DSL / ADSL	Femtocell
IP Timing	LTE
Precision GPS	SONET / SDH
WiMAX / WiBro	WLAN

Absolute Maximum Ratings

Parameter	Minimum	Nominal	Maximum	Units	Notes
Storage Temperature	-55	-	105	°C	
Supply Voltage (Vcc)	-0.5	-	4.6	Vdc	

Operating Specifications

Parameter	Minimum	Nominal	Maximum	Units	Notes
Output Frequency (Fo)	-	10.0	-	MHz	
Frequency Calibration @ 25 °C	-1.0	-	1.0	ppm	1
Frequency Stability	-0.28	-	0.28	ppm	2
Frequency vs. Load Stability	-0.20	-	0.20	ppm	±5%
Frequency vs. Voltage Stability	-0.20	-	0.20	ppm	±5%
Static Temperature Hysteresis	-	-	0.40	ppm	3
Freq. shift after reflow soldering	-1.0	-	1.0	ppm	4
Long Term Stability	-1.0	-	1.0	ppm	5
Aging					
per Life (20 Years)	-3.0	-	3.0	ppm	
per Day	-40	-	40	ppb	
Operating Temperature Range	-40	-	105	°C	
Supply Voltage (Vcc)	3.135	3.30	3.465	Vdc	
Supply Current (Icc)	-	2.1	6.0	mA	
Jitter:					
Period Jitter	-	3.0	5.0	ps RMS	
Integrated Phase Jitter	-	0.5	1.0	ps RMS	6
SSB Phase Noise					
@ 10 Hz offset	-	-98	-	dBc/Hz	
@ 100 Hz offset	-	-120	-	dBc/Hz	
@ 1 KHz offset	-	-143	-	dBc/Hz	
@ 10 KHz offset	-	-156	-	dBc/Hz	
@ 100 KHz offset	-	-158	-	dBc/Hz	
@ 1 MHz offset	-	-158	-	dBc/Hz	
Start-Up Time	-	-	10	ms	

LVCMOS Output Characteristics

Parameter	Minimum	Nominal	Maximum	Units	Notes
Load (CL)	-	15	-	pF	7
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%	-	4	8	ns	

RoHS COMPLIANT

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Package Characteristics

Package	Hermetically sealed ceramic package with grounded metal cover
Package Terminations:	0.5 to 1.0 um (20 to 40 micro-inches) Gold over minimum of 2.0um (80 micro-inches) Nickel.

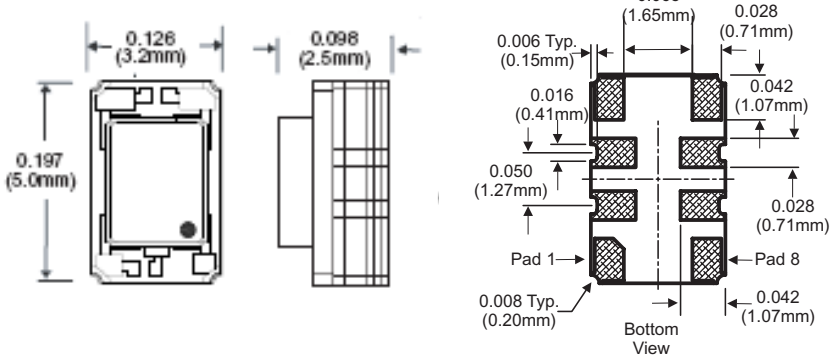
Environmental Characteristics

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.

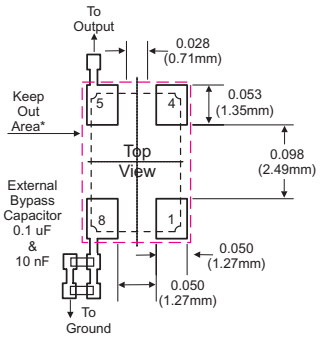
Notes:

1. *Initial calibration @ 25°C. ±2°C. Specifications at time of shipment after 48 hours of operation.*
2. *Frequency stability vs. change in temperature. [±(Fmax-Fmin)/2.Fo].*
3. *Frequency change after reciprocal temperature ramped over the operating range. Frequency measured before and after at 25°C*
4. *Two consecutive reflows after 1 hour recovery @ 25°C.*
5. *Frequency drift over 1 year @ 25°C.*
6. *BW = 12 KHz to Fo/2*
7. *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.*

Package Outline

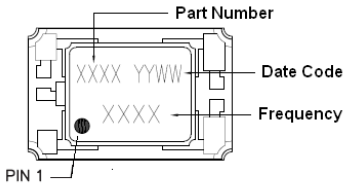


Suggested Pad Layout



* 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 Configuration



Ordering Information

M602A - 010.0M

Pad Connections

1:	N/C
2:	Do Not Connect
3:	Do Not Connect
4:	Ground
5:	Output
6:	Do Not Connect
7:	Do Not Connect
8:	Supply Voltage (Vcc)

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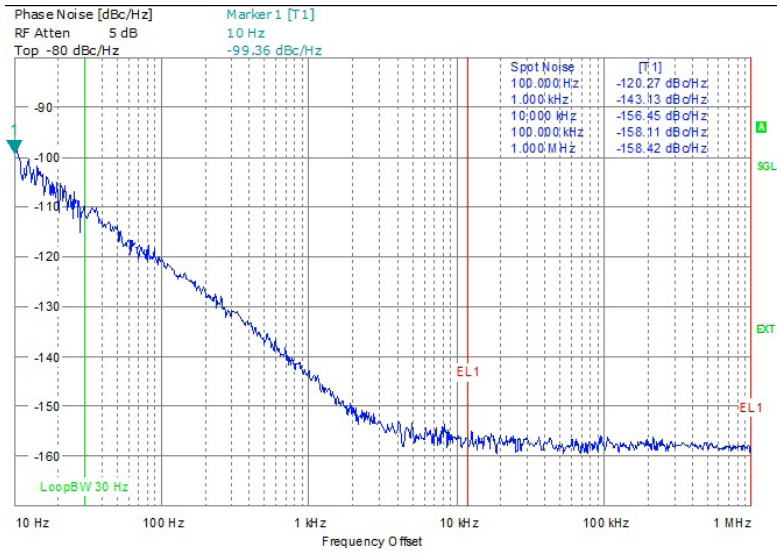
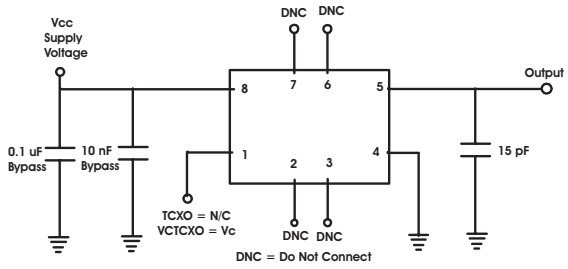
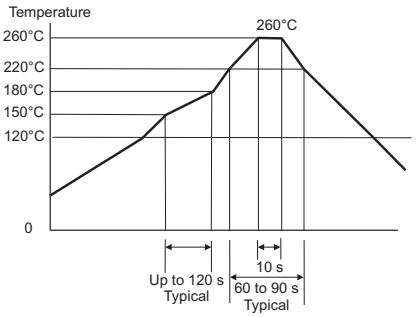
Typical Phase Noise



Test Circuit

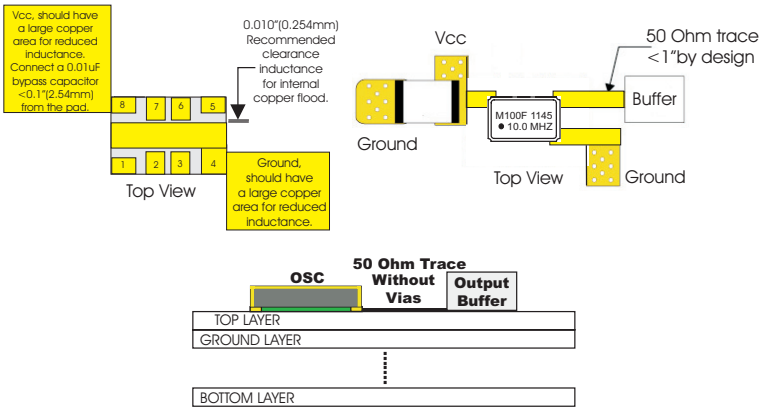


Solder Profile

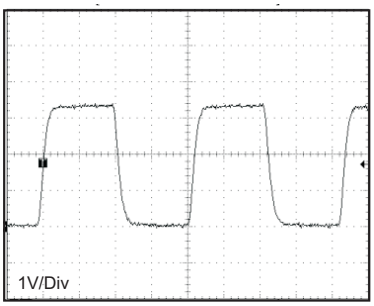


Meets IPC/JEDEC J-STD-020C

Design Recommendations

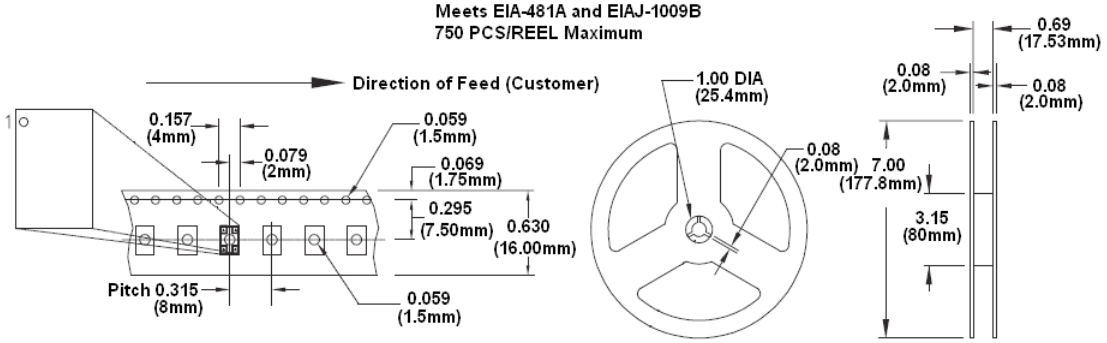


LVCMOS Output Waveform



Tape and Reel Information

Meets EIA-481A and EIAJ-1009B
750 PCS/REEL Maximum



Revision History

Revision	Date	Changes
00	05/25/23	Data sheet released
01	05/30/23	Photo updated