TX-801

High Stability
Temperature Compensated Crystal Oscillator

Description

The TX-801 TCXO provides fully compliant Stratum 3 levels of stability in a 5x3.2mm package. It is ideal for timing over IP applications such as 1588 PTP and Synchronous Ethernet.

Features

- Excellent Temperature Stability, Stratum 3 Compliant
- CMOS and Clipped Sinewave Output
- Low Phase Noise
- Phase Noise Filter Option
- Improved Temperature Cycling through 10 Pin Mounting
- 100% RoHS Compliant
- Frequency Range: 6.4 - 52[1] MHz
- Standard Frequencies: 6.4, 9.6, 10, 12.8, 13, 16.384, 19.2, 20, 20.48, 22.1184, 24.576, 25, 26, 30.72, 32, 38.88, 40 & 50MHz

Applications

- portable Radios
- 1588 Applications
- Wireline Stratum 3 applications
- Test & Measurement
- Wireless Communications
- Small Cells

Performance Specifications

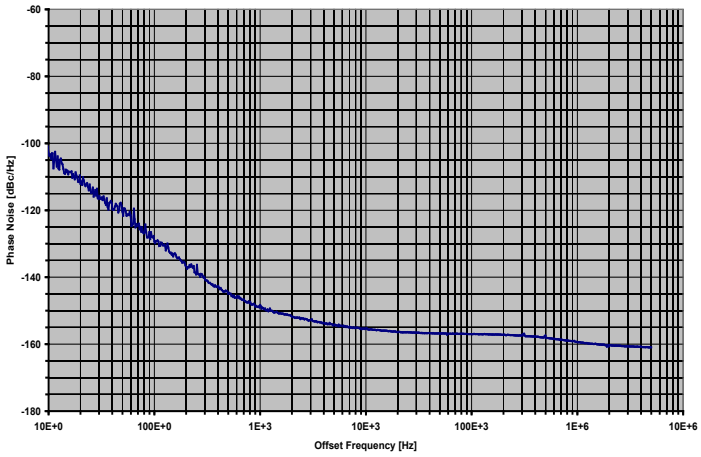
Frequency Stabilities[1]					
Parameter	Min	Typ	Max	Units	Condition
vs. operating temperature range (referenced to (dfmax+dfmin)/2)	-100		+100	ppb	-10 to +70°C
	-280		+280	ppb	-40 to +85°C
Holdover	-40		+40	ppb	In a 24h period at constant temperature
Initial tolerance	-1.0		+1.0	ppm	at time of shipment, @ Vc=Vs/2
vs. supply voltage change	-0.2		+0.2	ppm	V_S ±5% static @ HCMOS
	-0.1		+0.1	ppm	V_S ±5% static @ Clipped Sinewave
vs. load change	-0.2		+0.2	ppm	Load ±10% static @ HCMOS
	-0.1		+0.1	ppm	Load ±10% static @ Clipped Sinewave
vs. aging / 1st year	-0.5		+0.5	ppm	
vs. aging / 20 Years	-3.0		+3.0	ppm	
Overall tolerance	-4.6		+4.6	ppm	Note:*Stratum 3 per GR-1244-CORE: <±4.6ppm for all causes and 20 years aging, holdover: <±0.37ppm over 24 hours

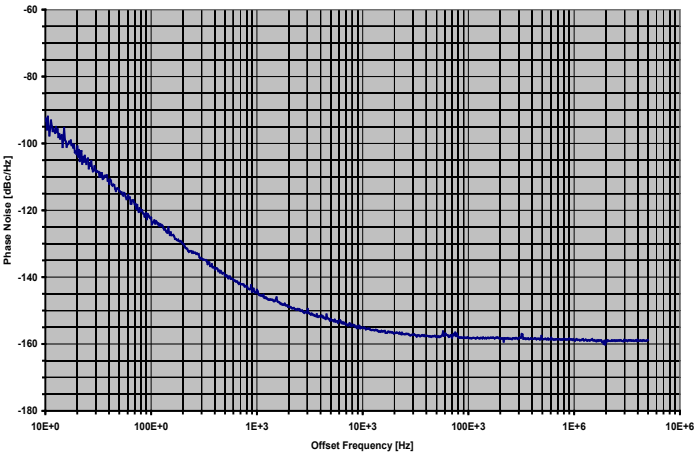
Performance Specifications

Supply Voltage (Vs)						
Parameter	Min	Typical	Max	Units	Condition	
Supply voltage (standard)	3.135	3.3	3.465	VDC		
Current consumption		1.6	2	mA	Clipped Sine @ 10MHz, steady state @ +25°C	
Current consumption		3.5	4	mA	LVCMOS @ 20MHz, steady state @ +25°C	
Current consumption		4.3	5	mA	LVCMOS @ 40MHz, steady state @ +25°C	
Current consumption		4.9	6	mA	LVCMOS @ 50MHz, steady state @ +25°C	
RF Output (Clipped Sinewave)						
Load R	9	10	11	kΩ		
Load || C	9	10	11	pF		
Output Power	1.0	1.2		V_{pp}	@ 10kΩ || 10pF	
RF Output (HCMOS)						
Load	13.5	15	16.5	pF		
Signal Level (Vol)			0.3	VDC	with Vs=3.3V and 15pF Load	
Signal Level (Voh)	3.0				with Vs=3.3V and 15pF Load	
Rise and Fall time			6.5	ns		
Duty Cycle	40	50	60	%	@ (Voh-Vol)/2	
Frequency Tuning (EFC)						
Tuning Range	Fixed TCXO; No adjustment				Options	
Tuning Range	±5.0		±10.0	ppm		
Linearity	10%					
Tuning Slope	Positive					
Control Voltage Range	0.5	1.5	2.5	VDC	@ V_s = 2.8V	
	0.3	1.65	3.0	VDC	@ V_s = 3.3V	
	0.5	2.5	4.5	VDC	@ V_s = 5V	
Freq. Control input impedance	100			kΩ		
Additional Parameters						
Weight			1.0	g		
Processing & Packing	Handling & Processing Note					
Reflow Profile	IPC / JEDEC J-STD-020 (latest version)					
Absolute Maximum Ratings						
Supply voltage (Vs)			6.0	V		
Control voltage	0		Vs	V		
Operable Temperature Range	-40		+105	°C	Max. Temperature depending on Specification	
Storage Temperature Range	-55		+125	°C		
Phase Noise[3]						
Phase Noise		-103 -129 -148 -155 -157		dBc/Hz dBc/Hz dBc/Hz dBc/Hz dBc/Hz	10 Hz 100 Hz 1 kHz 10 kHz 100 kHz	@ 10MHz
Phase Noise		-94 -122 -144 -155 -157		dBc/Hz dBc/Hz dBc/Hz dBc/Hz dBc/Hz	10 Hz 100 Hz 1 kHz 10 kHz 100 kHz	@ 20MHz
Additional Information	Bypass capacitor is recommended					

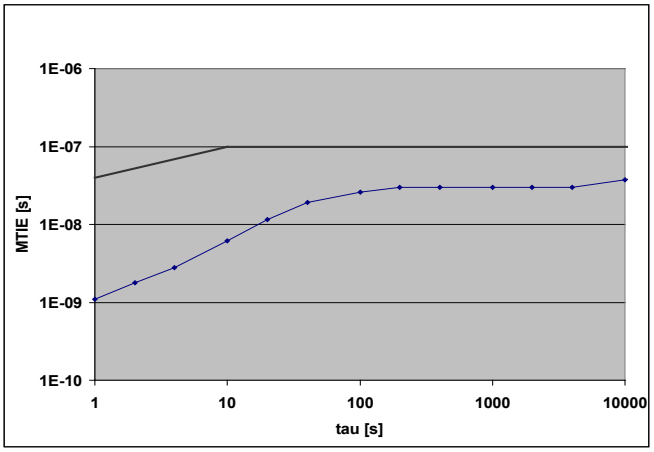
Typical Performance Data

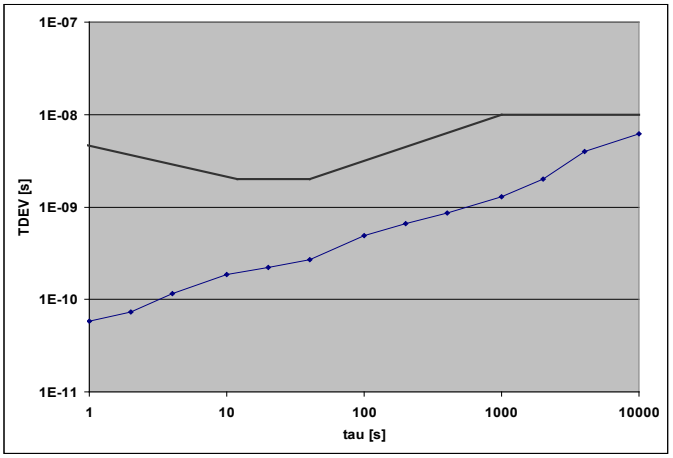
Phase Noise[3]	Phase Noise[3]
TX-801 @ 10MHz	TX-801 @ 20MHz



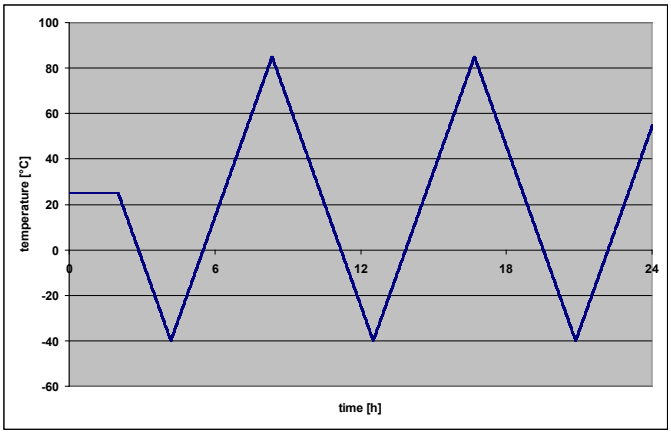


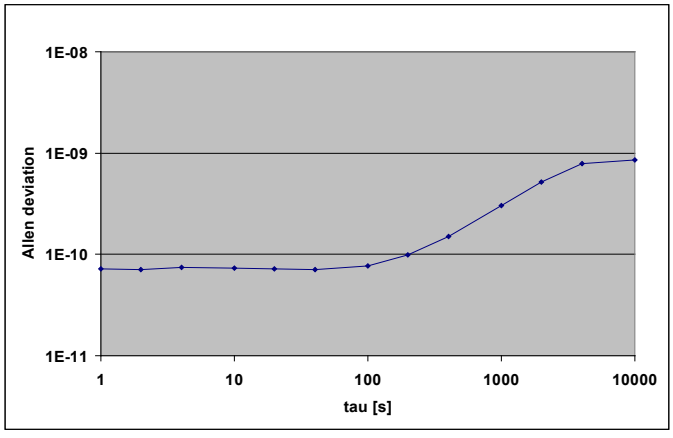
MTIE per GR1244 Wander	TDEV per GR1244 Wander
TX-801@ 20MHz; Temperature Ramp; 100mHz High Pass Filter	TX-801@ 20MHz; Temperature Ramp; 100mHz High Pass Filter



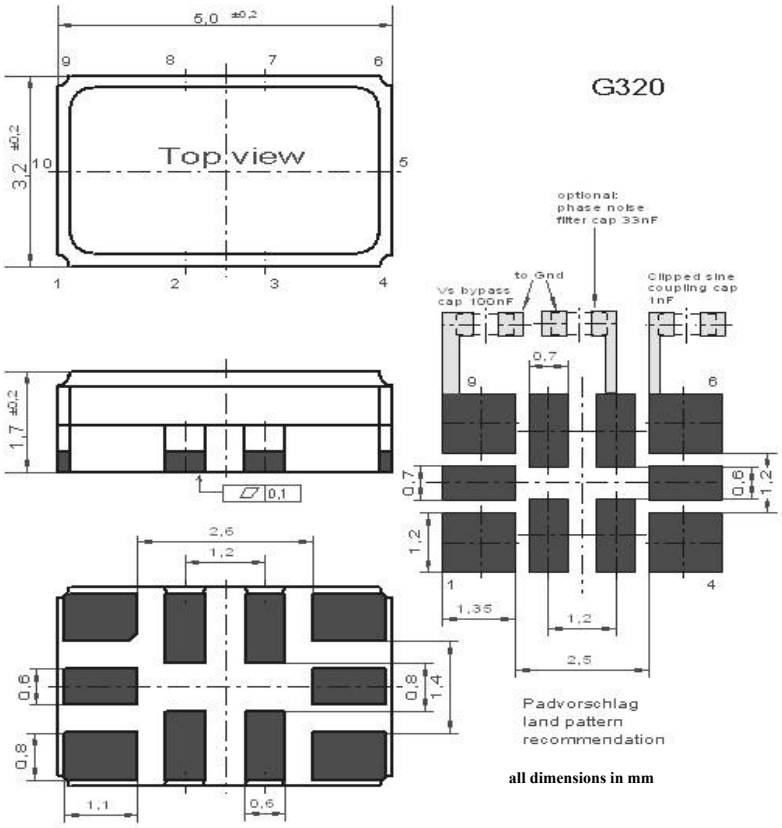


Temperature Ramp	ADEV
0.5K/min Slope	TX-801@ 20MHz; @40°C





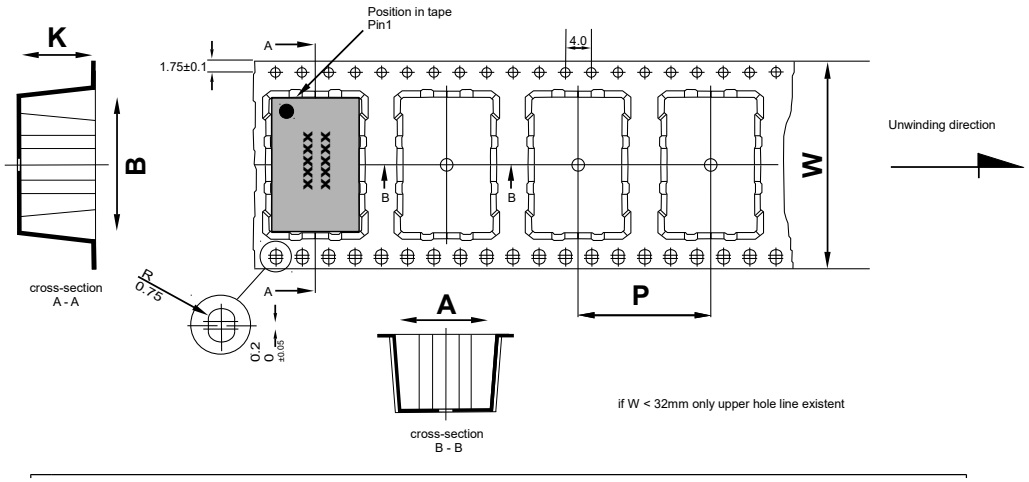
Outline Drawing / Enclosure



Enable pin function: TX-801	
Pin 8 state:	Pin 6 output:
High	Data
Open	Data
Low	High Tristate
Package Codes: 801	
Type	Height
G320	1.7mm
Marking: TX-801	
Specification	
Frequency	
·VI AYYWW	

Pin Connections	
1	Voltage Control (V_C) or No Connect (option)
2	Do not connect
3	Do not connect
4	Ground (GND)
5	Ground (GND)
6	RF Output
7	Phase Noise Filter Capacitor (optional)
8	Enable Control
9	Supply Voltage Input (V_S)
10	Ground (GND)

Standard Shipping Method



Enclosure Type	Tape Width W (mm)	Quantity per meter	Quantity per reel	Dimension P
G320	12	150	750	8

Recommended Reflow Profile

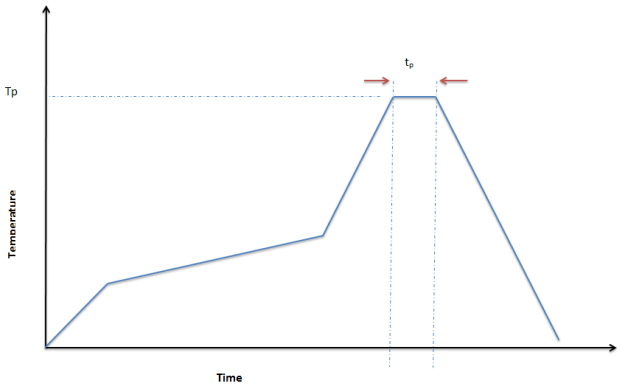
TP: max 250°C (@ solder joint, customer board level)

T_p: max: 10…30 sec

Additional Information:

This SMD oscillator has been designed for pick and place reflow soldering

SMD oscillators must be on the top side of the PCB during the reflow process.



Environmental Conditions

Rapid Temperature Changes	MIL-883-1010 Cond B 1000 cycles -55/125C
Vibration	MIL-STD-883 Meth 2007 Cond A 20G 20-2000Hz 4x in each 3axis 4 min
Shock	MIL-STD-202 Meth 213B Cond. F; 1500g 0,5ms 6 shocks in each direction
Solderability	J_STD_002C Cond A, Through hole device/ Cond. B, SMD 255C (diving time 50,5sec.) Dip+Look with 8h damp pre-treatment: solder wetting >95%
Solvent Resistance	MIL-STD-883 Meth 2015 Solv. 1,3,4
ESD	JESD22-A114F Class 1B; 10* 1000V
Moisture Sensitivity	Level 1 JESD22-A113-B
RoHS Compliance	100% ROHS compliant

Ordering Information

TX - 801 0 - E A J - 107 0 - 10M0000000

- **Product Family**: TX: TCXO
- **Package**: SMD G320
- **Height**: 0: 1.7mm
- **Supply Voltage**: D: 5V; E: 3.3V; G: 2.8V
- **RF Output Code**: A: HCMOS; F: Clipped Sinewave
- **Temperature Range**: W: -10°C to +70°C; E: -40°C to +85°C
- **Stability Code**: 107: ±100ppb; 207: ±200ppb; 287: ±280ppb; 106: ±1.0ppm
- **Frequency Control**: 0: No Tuning; 1: EFC: ±5.0 to 10ppm
- **Frequency**

Notes:

1. Contact factory for improved stabilities or additional product options. Not all options and codes are available at all frequencies.
2. Unless otherwise stated all values are valid after warm-up time and refer to typical conditions for supply voltage, frequency control voltage, load, temperature (25°C).
3. Phase noise with optional Phase noise Filter Capacitor. Phase noise degrades with increasing output frequency.
4. Subject to technical modification.
5. Contact factory for availability.

Contact Information

USA:
100 Watts Street
Mt Holly Springs, PA 17065
Tel: 1.717.486.3411
Fax: 1.717.486.5920

Europe:
Landstrasse
74924 Neckarbischofsheim
Germany
Tel: +49 (0) 7268.801.0
Fax: +49 (0) 7268.801.281

Vectron™ a Microchip company

Information contained in this publication regarding device applications and the like is provided only for your convenience and may be superseded by updates. It is your reasonability to ensure that your application meets with your specifications. MICROCHIP MAKES NO REPRESENTATION OR WARRANTIES OF ANY KIND WHETHER EXPRESS OR IMPLIED, WRITTEN OR ORAL, STATUTORY OR OTHERWISE, RELATED TO THE INFORMATION INCLUDING, BUT NOT LIMITED TO ITS CONDITION, QUALITY, PERFORMANCE, MERCHANTABILITY OR FITNESS FOR PURPOSE. Microchip disclaims all liability arising from this information and its use. Use of Microchip devices in life support and/or safety applications is entirely at the buyer's risk, and the buyer agrees to defend, indemnify and hold harmless Microchip from any and all damages, claims, suits, or expenses resulting from such use. No licenses are conveyed, implicitly, or otherwise, under any Microchip intellectual property rights unless otherwise stated.

Trademarks
The Microchip and Vectron names and logos are registered trademarks of Microchip Technology Incorporated in the U.S.A. and other countries.