STXO OSCILLATOR

Product Family

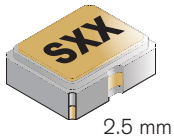
10 MHz to 80 MHz

Low Jitter, Tight Frequency Stability,
Low Phase Noise CMOS Clock Oscillator

DESCRIPTION

State-of-the-art design, process, manufacturing and testing capabilities have made the development of the ultra-miniature STXO oscillators achievable. Performance capabilities include low RMS phase jitter (typical < 300 femtoseconds), low phase noise (noise floor typical < -161 dBc/Hz) and tight frequency stability (± 5 ppm total). Contact Statek for tighter tolerances.

3.2 mm x 2.5 mm



2.5 mm x 2.0 mm

FEATURES

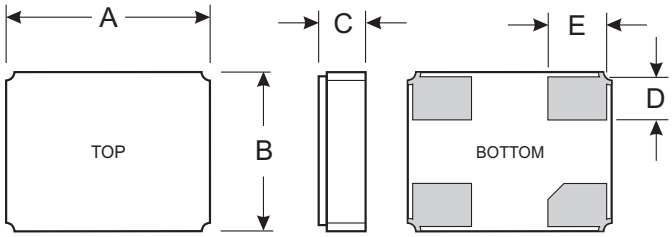
- High shock survival option up to 75,000 g
- Tight frequency stability and low phase noise
- Ultra-low Allan Deviation and RMS phase jitter
- Ultra-low period jitter; 1.4 ps RMS
- Low acceleration sensitivity
- Low current consumption; 3.0 mA max no load across temp
- Full military testing per MIL PRF 55310 available
- CMOS output; enable/disable with Tri-State
- Fundamental frequency; no PLL artifacts
- Hermetically sealed ceramic package
- Designed, manufactured and tested in the USA

APPLICATIONS

Defense and Aerospace

- RF Telemetry
- Master Clock

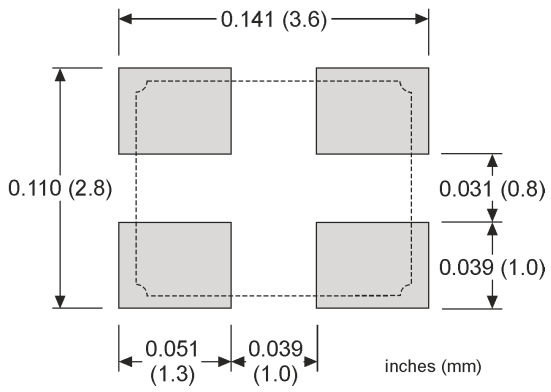
DIMENSIONS



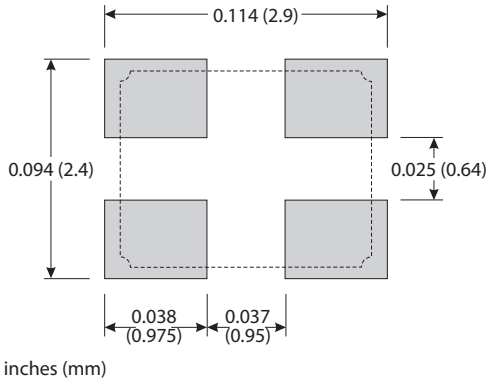
	MAXIMUM		MAXIMUM	
PACKAGE	**3.2 X 2.5 MM**		**2.5 X 2.0 MM**	
DIM	inches	mm	inches	mm
A	0.136	3.40	0.102	2.60
B	0.107	2.70	0.083	2.10
C (SM1)	0.053	1.35	0.039	1.00
C (SM3/SM5)	0.058	1.47	0.048	1.22
D	0.041	1.10	0.027	0.69
E	0.031	0.85	0.023	0.59

SUGGESTED LAND PATTERN

3.2 mm x 2.5 mm



2.5 mm x 2.0 mm



10220 Rev E

SPECIFICATIONS

Specifications are typical at 25°C unless otherwise noted. Specifications are subject to change without notice. Tighter specifications are available. Please contact factory.

Frequency	10 MHz to 80 MHz
Supply Voltage	2.5V, 3.0V and 3.3 V ± 10%
Total Frequency Tolerance[1,2]	± 5 ppm (Industrial) Contact Factory for other temperature ranges
Supply Current (Typical)[3]	15 pF load / 3.3 V 40 MHz / 3 mA
Output Voltage Levels	V_{OH} / V_{DD} -0.4 V min V_{OL} / 0.4 V max
Output Load (CMOS)	15 pF
Start-up Time	5 ms MAX
Rise/Fall Time	5 ns MAX
Duty Cycle	45% MIN/55% MAX
Aging, first year	2 ppm
Shock, survival	STD: 5,000 g, 0.5 ms, ½ sine HG: up to 75,000 g, 0.5 ms, ½ sine
Vibration, survival[4]	20 g, 10-2,000 Hz swept sine
Operating Temp. Ranges	-40°C to 85°C (Industrial) -55°C to 125°C (Military)

Typical Period Jitter (RMS) at 40 MHz & 20 MHz is 1.4 ps over 10,000 cycles

Moisture Sensitivity Level (MSL) - This product is hermetically sealed and not moisture sensitive.

1. Contact factory for tighter total frequency tolerance.
2. -40°C to 105°C available, contact factory.
3. V_{DD} = 3.3 V, 15 pF load, frequency at 40 MHz.
4. Per MIL-STD-202G, Method 204D, Condition D. Random vibration testing also available.

Note: All parameters are measured at ambient temperature with a 10 MΩ, 15 pF load.

ABSOLUTE MAXIMUM RATINGS

Supply Voltage V_{DD}	-0.3 V to 4.0 V
Storage Temperature	-55°C to 125°C
Maximum Process Temperature	260°C for 20 seconds

ENABLE/DISABLE OPTIONS (E/N)

Statek offers two enable/disable options: E and N. The E-version has a Tri-State output and stops oscillating internally when the output is put into the high Z state. The N-version does not have PIN 1 connected internally and so has no enable/disable capability. The following table describes the Enable/Disable option E.

ENABLE/DISABLE OPTION E FUNCTION TABLE

	Enable (Pin 1 High*)	Disable (Pin 1 Low)
Output	Frequency Output	High Z State
Oscillator	Oscillates	Stops
Current	Normal	Very Low

*When PIN 1 is allowed to float, it is held high by an internal pull-up resistor.

PIN CONNECTIONS

1. Output Enable/Disable (E) or no connection (N)
2. Ground
3. Output
4. V_{DD}

PACKAGING OPTIONS

STXO - Tray Pack
- 12 mm tape, 7" or 13" reels Per EIA 481

HOW TO ORDER STXO SURFACE MOUNT CRYSTAL OSCILLATORS

STXO A D 4 S N ____ — 20.0M , ___ / ___ / 5 / I

- **A**: A = 3.2 x 2.5 mm; B = 2.5 x 2.0 mm
- **D**: Blank = STD 5,000 g; D = 30,000 g; F = 50,000 g; G = 75,000 g
- **4**: Supply Voltage — 2 = 2.5 V; 3 = 3.0 V; 4 = 3.3 V
- **S**: "S" if Special or custom design; otherwise blank
- **N**: Enable/Disable Option — E or N
- **____**: Terminations — Blank = SM1; = Gold Plated (Lead Free); SM3 = Solder Dipped; SM5 = Solder Dipped (Lead Free)
- **20.0M**: Frequency — M = MHz
- **5**: Total Frequency Tolerance (in ppm)
- **I**: Temp. Range: I = -40°C to +85°C; M = -55°C to +125°C; S = Customer Specified

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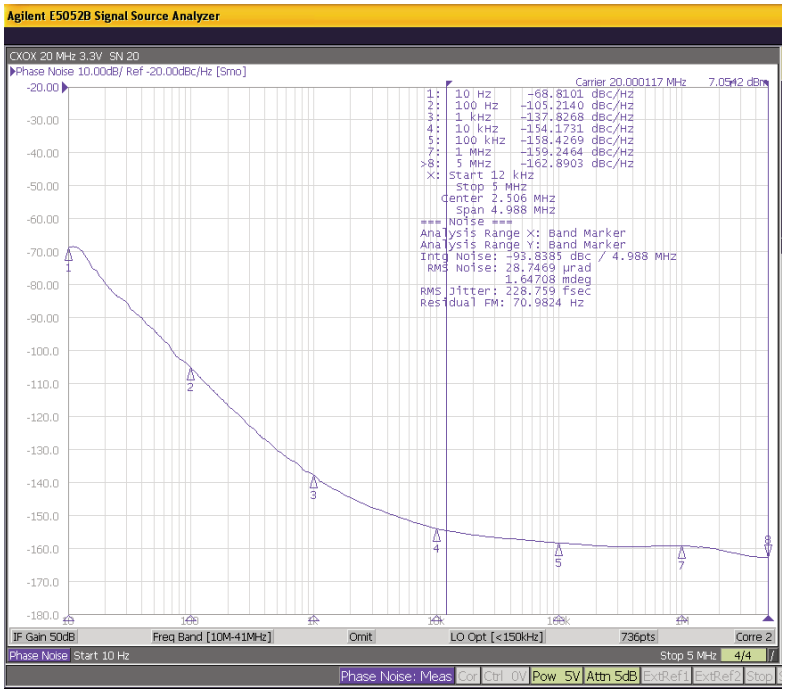
PHASE NOISE AND JITTER PERFORMANCE

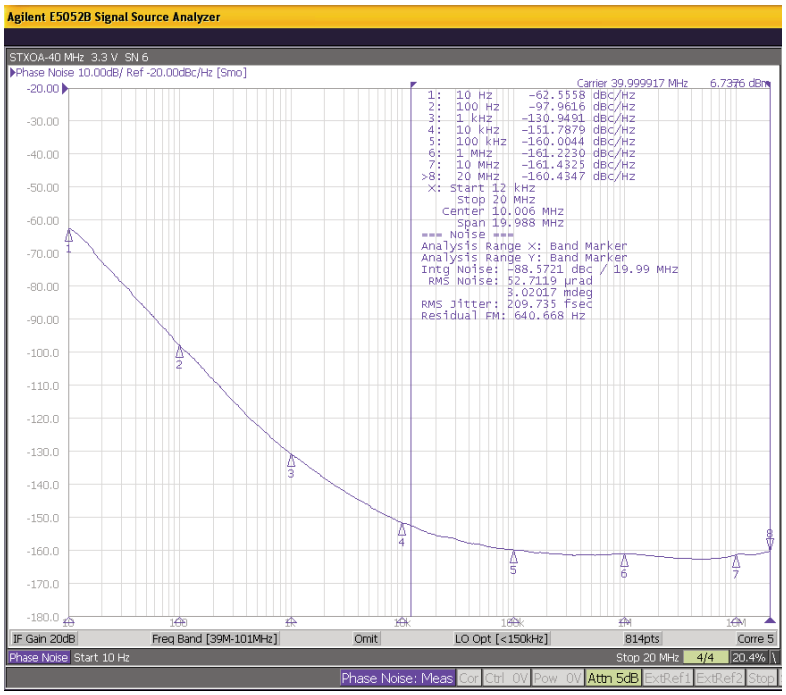
Typical Phase Noise (dBc/Hz)		
Frequency Offset (Hz)	Clock Frequency (MHz)	
	20 MHz	40 MHz
10 Hz	-69	-61
100 Hz	-105	-98
1 kHz	-138	-131
10 kHz	-154	-151
100 kHz	-158	-160
1 MHz	-159	-161
5 MHz / 10 MHz	-163	-161
20 MHz	-	-161

Integrated RMS Jitter (12 kHz to 20MHz)[1]		
Frequency	**V_{DD} = 2.5V**	**V_{DD} = 3.3V**
20 MHz	256 femtosec.	229 femtosec.
40 MHz	232 femtosec.	228 femtosec.

1) 20 MHz integration point is Clock Frequency dependent.

Phase noise performance at 20 MHz and 40 MHZ





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