SaRonix™
A PERICOM® COMPANY

3.3V CMOS Ultra Low Jitter
Voltage Controlled Crystal Oscillator (VCXO)

Actual Size = 5 x 7mm

Product Features

- High Q fundamental-mode crystal
- No internal PLL or frequency multiplication
- Very low phase noise
- LVCMOS compatible output
- Commercial and industrial operation
- ±50 ppM stability (or as specified)
- ±50 to ±100 ppM absolute (net) pull range
- RoHS Compliant

Product Description

The ST1307 is a voltage controlled crystal oscillator that achieves superb jitter and pullability over a broad range of operating conditions and frequencies. The device is constructed with a hermetically sealed, fundamental-mode quartz crystal resonator exhibiting a high-Q for exceptional phase noise performance. The device, available on tape and reel, is contained in a 5x7mm ceramic package.

Applications

The ST1307 Series VCXO is an ideal component in phase locked loop circuits that perform clock smoothing, clock/data recovery, or frequency translation and card synchronization functions, supporting jitter-sensitive applications such as:

- SMPTE-compliant Video networking
- SONET/SDH timing control and line cards
- T1/E1 Platforms
- Satellite and microwave communications

Package Outline

2.00 / .079 max

#1   #2   #3

5.00±0.15 / .197±.005

#6   #5   #4

7.00±0.15 / .276±.006
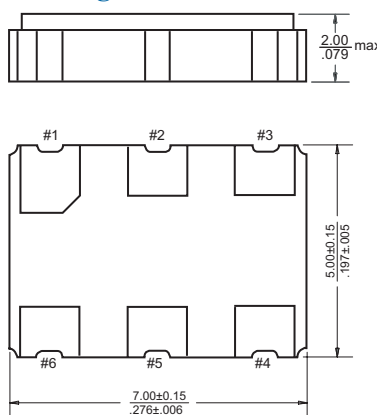
Pin Functions

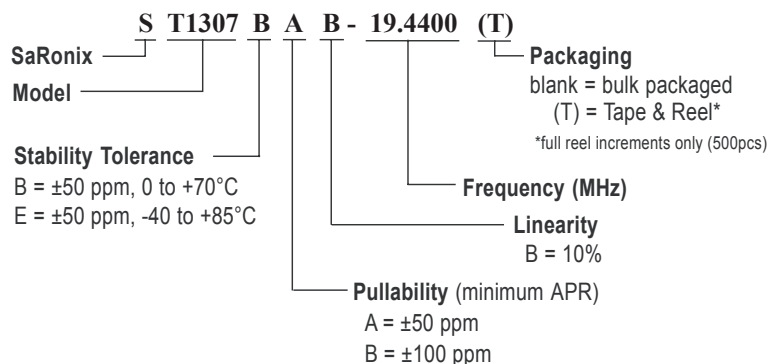| Pad	Function
1	Control voltage
2	Output Enable/Disable
3	Ground
4	Output
5	No Connect
6	Supply voltage

Full Mechanical Drawings page 6.
Dimensions are in mm/inches.

Common Frequencies

Contact SaRonix for additional frequencies

1.5440	14.7456	20.4800
2.0480	15.0000	24.5760
6.1760	16.3840	25.0000
8.1920	18.4320	27.0000
12.2880	19.4400	
12.3520	20.0000	

Ordering Information

S T1307 B A B - 19.4400 (T)

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Model

Stability Tolerance
B = ±50 ppm, 0 to +70°C
E = ±50 ppm, -40 to +85°C

Pullability (minimum APR)
A = ±50 ppm
B = ±100 ppm

Linearity
B = 10%

Frequency (MHz)

Packaging
blank = bulk packaged
(T) = Tape & Reel*
*full reel increments only (500pcs)

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Electrical Performance

Parameter	Min.	Typ.	Max.	Units	Notes
Output frequency (F_N)	1.0		32.0	MHz	As specified
Supply voltage	+2.97	+3.3	+3.63	V	
Supply current			15	mA	
Frequency stability			±50	ppM	See #1 and #2 below
Operating temperature	-40		+85	°C	As specified
Output logic 0, V_{OL}			10% V_{DD}	V	
Output logic 1, V_{OH}	90% V_{DD}			V	
Output load			30	pF	
Duty cycle	45		55	%	measured 50% V_{DD}
Rise and fall time			8	ns	measured 20/80% V_{DD}
Jitter, total			20	ps pk-pk	

Notes:
1. As specified. Stability includes all combinations of operating temperature, load changes, rated input (supply) voltage changes, shock and vibration, with control voltage held at center.
2. ±12 ppM max due to aging (10 years at 40°C average ambient operating temperature).

Frequency Modulation Function

Parameter	Min.	Typ.	Max.	Units	Notes
Absolute pull range (APR)	±50 to ±100			ppM	See #1 below
Control voltage range	+0.3		+3.0	V_{DC}	As rated
Center control voltage		+1.65		V	For RMT center frequency
Monotonic linearity			10	%	Positive transfer slope
Input impedance	50			kΩ	Control voltage pin
Modulation bandwidth	50			kHz	-3dB

Notes:
1. As specified. APR is relative to the nominal output frequency F_N; APR is inclusive (net) of frequency deviation due to stability.
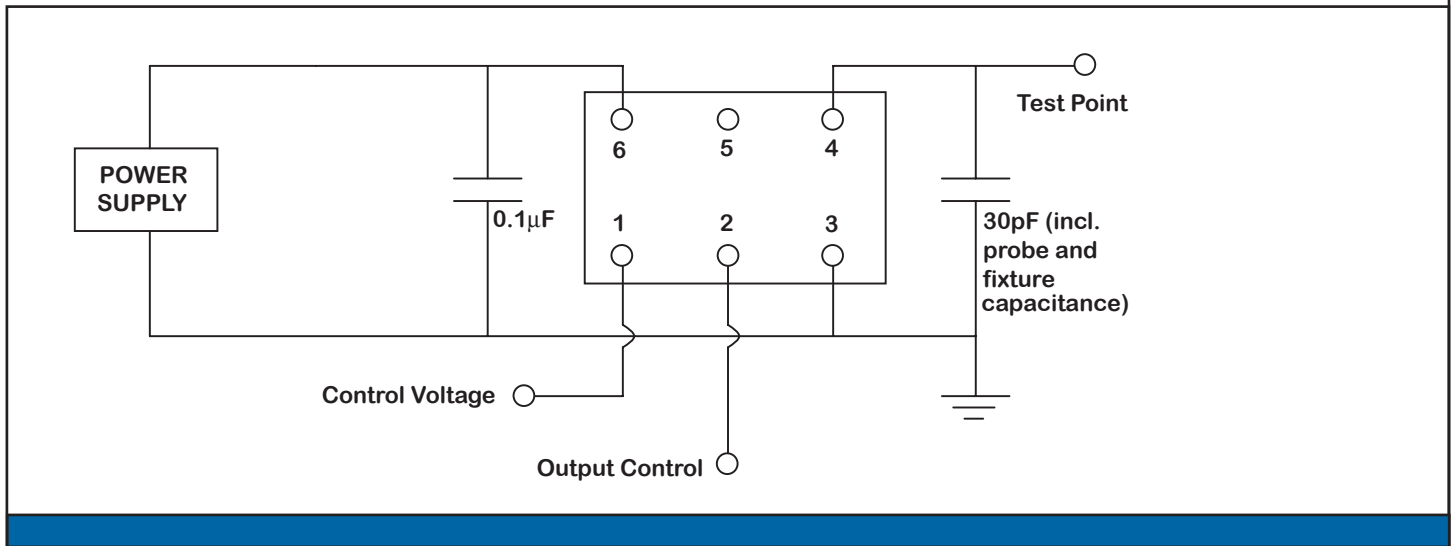
Output Enable / Disable Function

Parameter	Min.	Typ.	Max.	Units	Notes
Input voltage, output enable	3.0			V	or open
Input voltage, output high impedance			0.3	V	Output is high impendance

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Absolute Maximum Ratings

Parameter	Min.	Typ.	Max.	Units	Notes
Storage temperature	-55		+125	°C	
Control voltage range	-0.5		V_{DD} +0.5	V	

Test Circuit

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Output Waveform

Duty cycle = 100% × (t$_A$) / (t$_A$ + t$_B$)
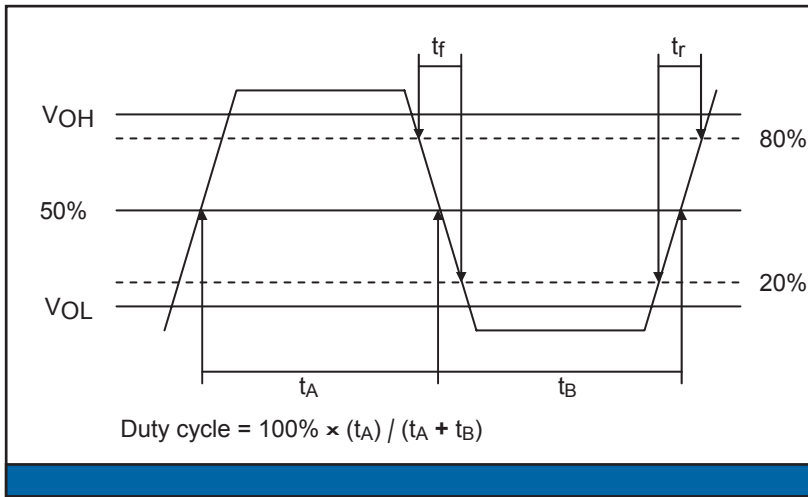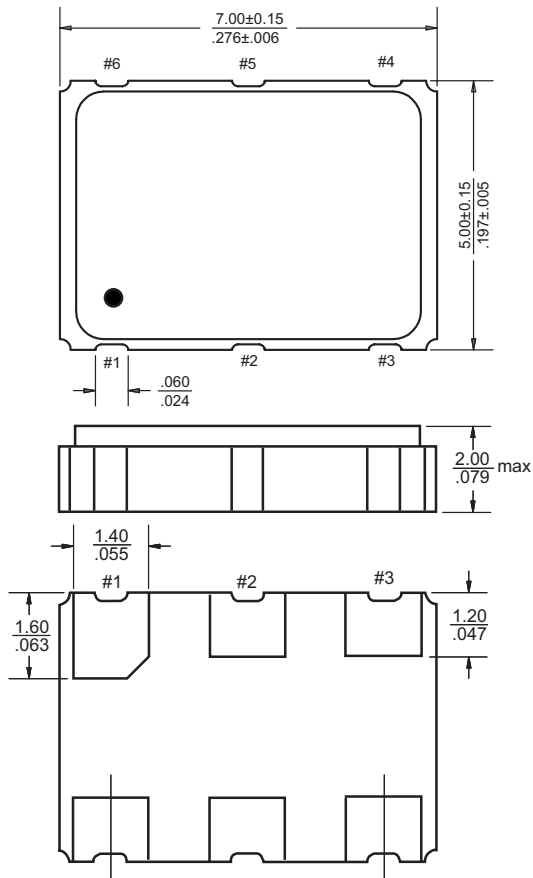
Solder Reflow Guide
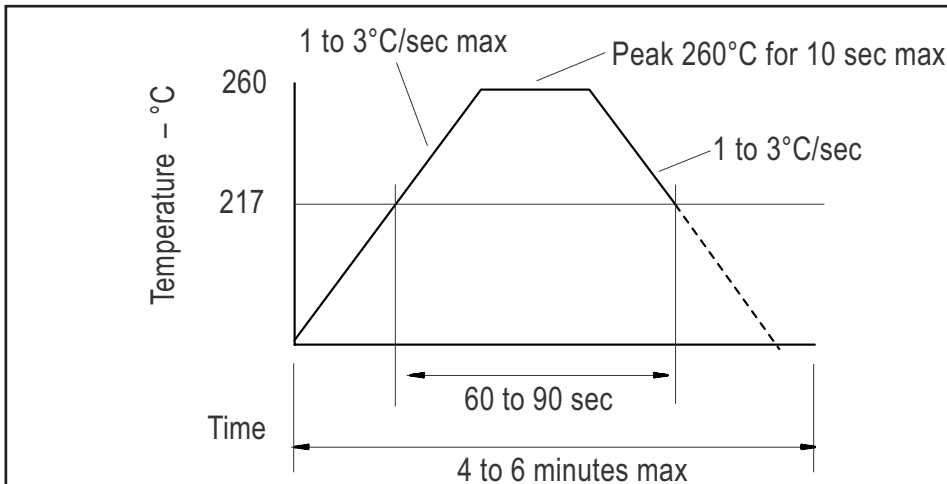
Reliability Test Ratings
This product is rated under the following test conditions:

Type	Parameter	Test Condition
Mechanical	Shock	MIL-STD-883, Method 2002, Condition B
Mechanical	Solderability	JESD22-B102-D Method 2 (Preconditioning E)
Mechanical	Terminal strength	MIL-STD-883, Method 2004, Condition D
Mechanical	Solvent resistance	MIL-STD-202, Method 215
Environmental	Thermal shock	MIL-STD-883, Method 1011, Condition A
Environmental	Moisture resistance	MIL-STD-883, Method 1004
Environmental	Vibration	MIL-STD-883, Method 2007, Condition A
Environmental	Resistance to soldering heat	J-STD-020C Table 5-2 Pb-free devices (2 cycles max)

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Mechanical Drawings

Recommended Land Pattern*
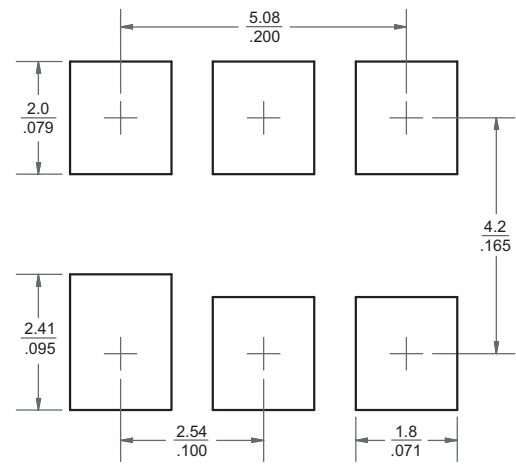
*External high-frequency power decoupling is recommended.(see test circuit for minimum recommendation). To ensure optimal performance, do not route traces beneath the package.

Scale: None. Dimensions are in mm/inches.

Marking LINE 1:	**ST1307xxx**	**(SaRonix, Model, Option Codes)**
Marking LINE 2:	**12.3456**	**(Frequency in MHz)**
Marking LINE 3:	**• YYWWx**	**(Pin 1, Year, Week, Origin)**

** Exact location of items may vary

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