

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



Actual Size = 9 x 14mm



Product Features

- Frequencies available between 38.88 and 125 MHz
- High frequency fundamental-mode crystal
- No internal PLL or frequency multiplication
- Less than 0.5 ps RMS jitter
- LVCMOS compatible output
- Commercial and industrial operation
- ± 20 ppm stability (or as specified)
- ± 50 ppm absolute (net) pull range
- 9x14mm true SMT design

Product Description

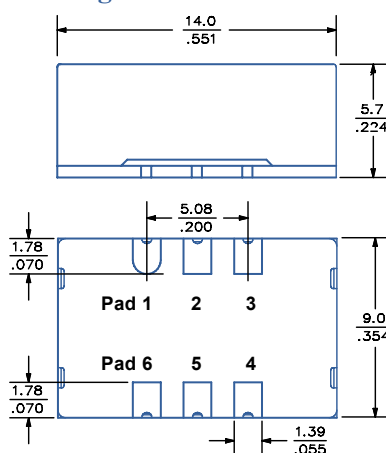
The ST1308 is a voltage controlled crystal oscillator that achieves superb jitter and temperature stability over a broad range of operating conditions and frequencies. The device is constructed with a hermetically sealed, fundamental-mode quartz crystal resonator exhibiting a high-Q for exceptional phase noise performance. The device, available on tape and reel, is contained in a 9x14mm leadless FR4 package.

Applications

The ST1308 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
- Gigabit Ethernet and FibreChannel
- Satellite and microwave communications
- Server & Storage platforms

Package Outline



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

38.8800	51.8400	54.0000
62.5000	65.5360	74.1758
74.2500	75.0000	77.7600
100.0000	106.2500	108.0000
125.0000		

Ordering Information

SaRonix	Model	ST1308	AA	BB	- 74.2500	(T)	Packaging
							blank = bulk packaged (T) = Tape & Reel*
							*full reel increments only (500pcs)
							Frequency (MHz)
							Linearity
							B = 10%
							Pullability (minimum APR)
							A = ± 50 ppm

**3.3V CMOS Ultra Low Jitter, High Frequency
Voltage Controlled Crystal Oscillator (VCXO)**
Electrical Performance

Parameter	Min.	Typ.	Max.	Units	Notes
Output frequency (F_N)	38.88		125	MHz	As specified
Supply voltage	3.135	3.3	3.465	V	
Supply current			30	mA	
Frequency stability	±20		±50	ppM	See #1 below
Operating temperature	-40		+85	°C	As specified
Output logic 0, V_{OL}			0.4	V	$I_{OL} = 2\text{mA max}$
Output logic 1, V_{OH}	2.4			V	$I_{OH} = -2\text{mA max}$
Output load			20	pF	
Duty cycle	45		55	%	measured 1.4V
Rise and fall time			3	ns	measured 10/90%
Jitter, phase			0.5	ps RMS (1- σ)	12kHz to 40MHz frequency band
Jitter, accumulated			3.5	ps RMS (1- σ)	20,000 adjacent periods
Jitter, total			25	ps pk-pk	100,000 random periods
Phase Noise		-60		dBc/Hz	10 Hz offset
Phase Noise		-85		dBc/Hz	100 Hz offset
Phase Noise		-115		dBc/Hz	1 kHz offset
Phase Noise		-140		dBc/Hz	10 kHz offset
Phase Noise		-150		dBc/Hz	100 kHz offset

Notes:

- As specified. Stability includes all combinations of operating temperature, load changes, rated input (supply) voltage changes, aging (5 years at 40°C average ambient temperature), shock and vibration.

Frequency Modulation Function

Parameter	Min.	Typ.	Max.	Units	Notes
Absolute pull range (APR)	±50			ppM	See #1 below
Control voltage range	0.3		3.0	V_{DC}	As rated
Center control voltage	1.32	1.65	1.98	V	For RMT center frequency
Monotonic linearity			10	%	Positive transfer slope
Input impedance	50			k Ω	Control voltage pin
Modulation bandwidth	10			kHz	-3dB

Notes:

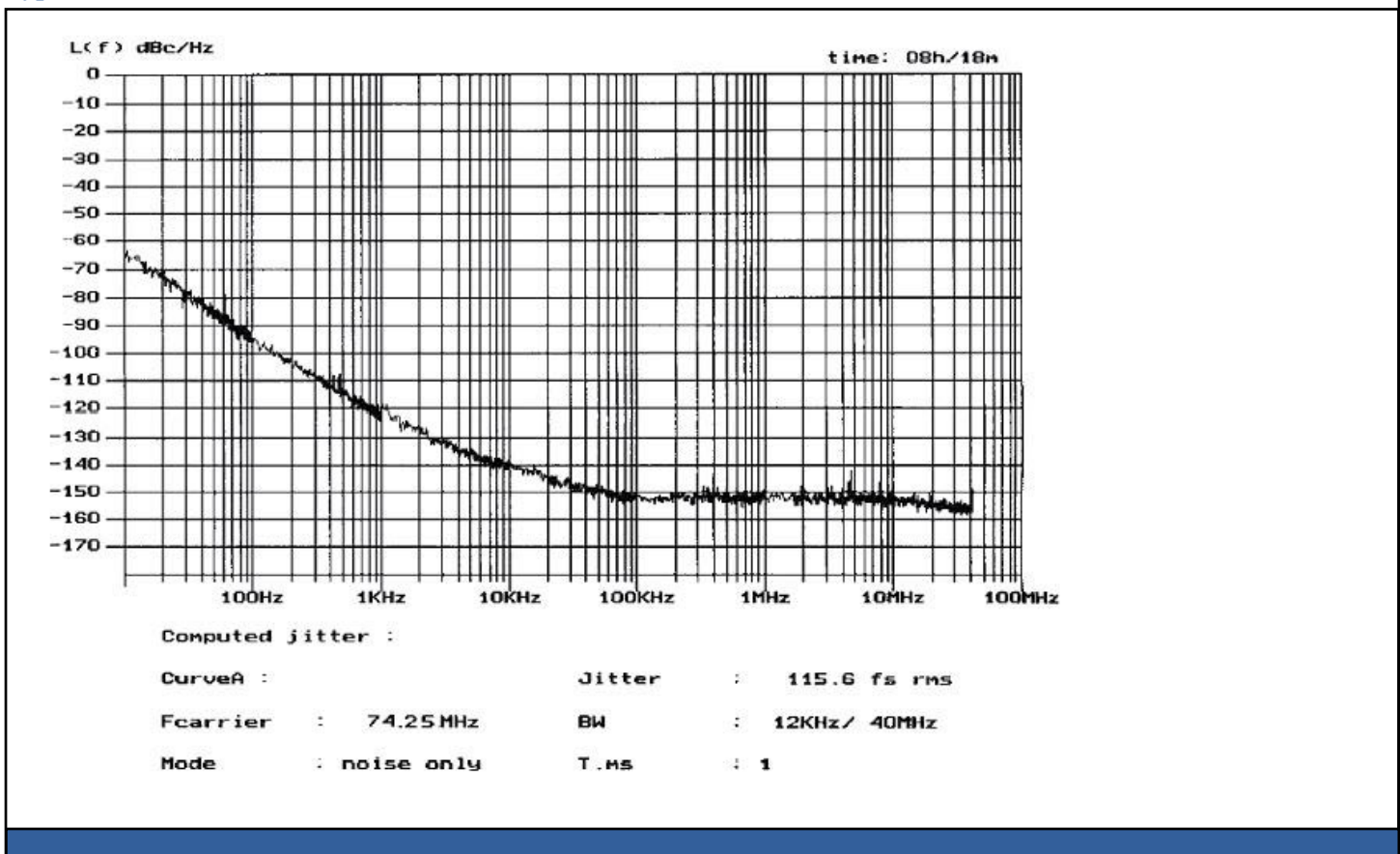
- APR is relative to the nominal output frequency F_N (as specified); APR is inclusive (net) of frequency deviation due to stability.

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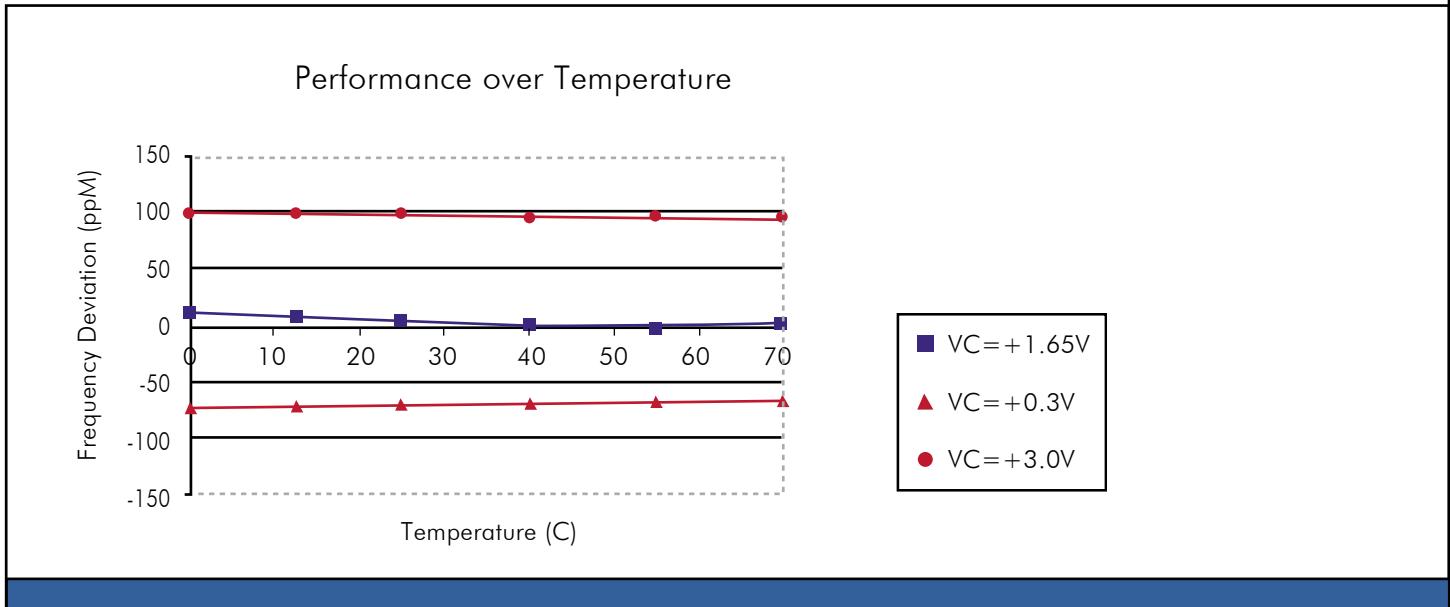
Output Enable / Disable Function

Parameter	Min.	Typ.	Max.	Units	Notes
Input voltage, output enable	2.2			V	
Input voltage, output high impedance			0.8	V	
Output disable delay			100	ns	
Internal pullup resistance	50			k Ω	

Typical Phase Noise



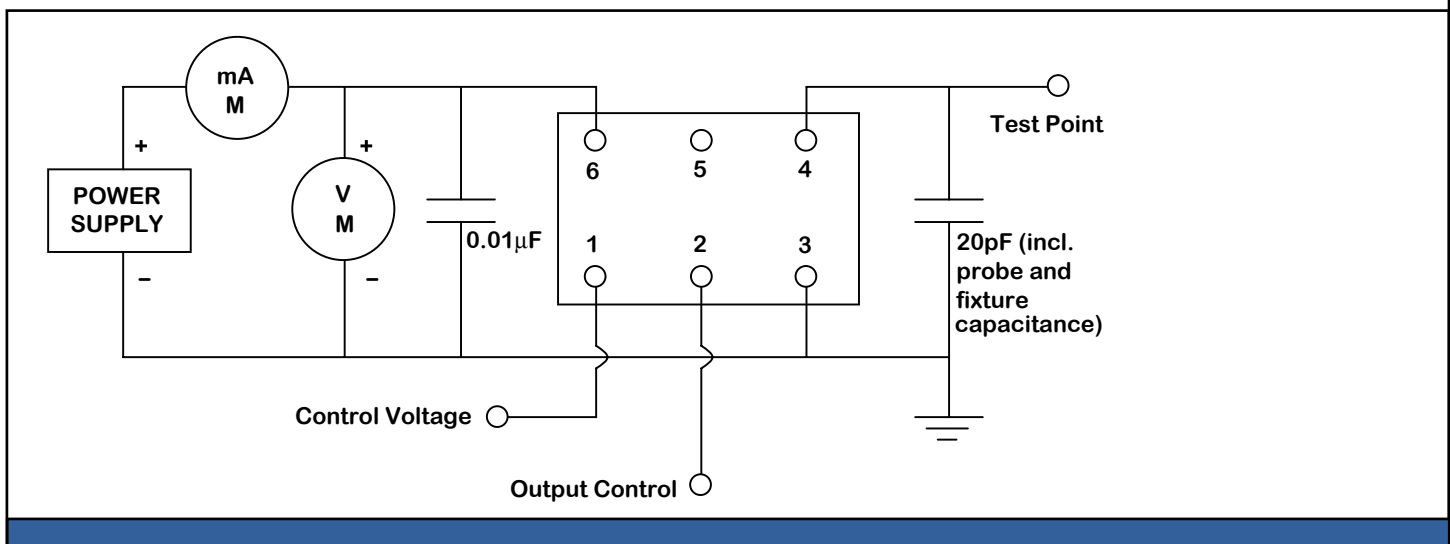
Typical Temperature and Pull Characteristics



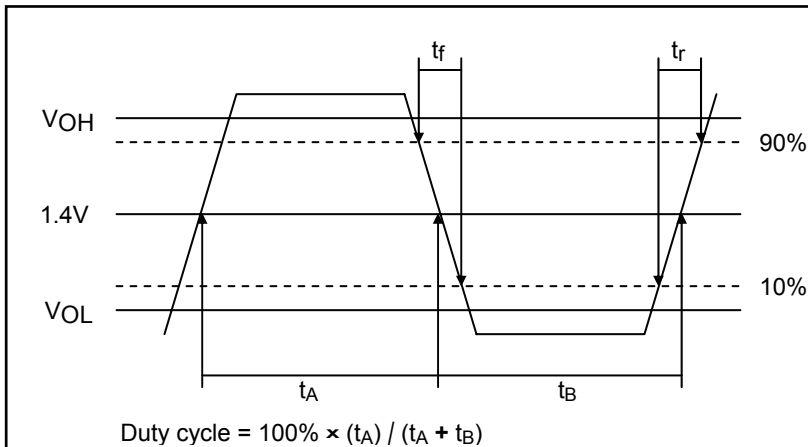
Absolute Maximum Ratings

Parameter	Min.	Typ.	Max.	Units	Notes
Storage temperature	-55		+125	°C	
Control voltage range	0		V _{CC}	V	

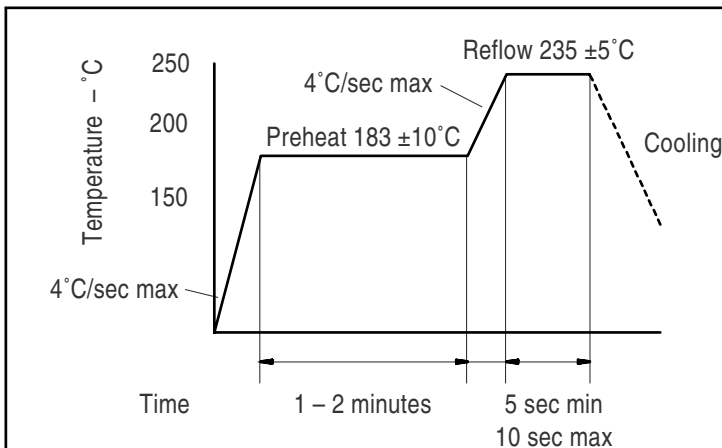
Test Circuit



Output Waveform



Solder Reflow Guide



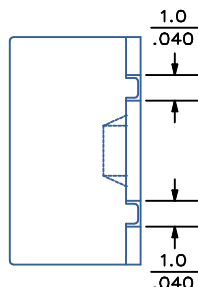
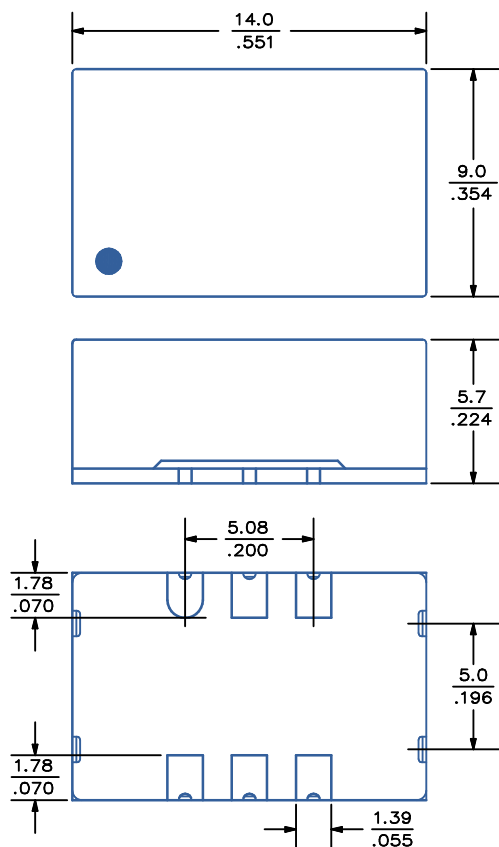
Reliability Test Ratings

This product is rated under the following test conditions:

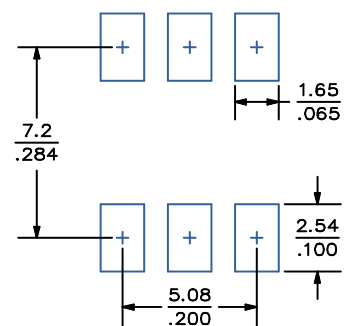
Type	Parameter	Test Condition
Mechanical	Shock	MIL-STD-883, Method 2002, Condition B
Mechanical	Solderability	MIL-STD-883, Method 2003
Mechanical	Terminal strength	MIL-STD-883, Method 2004, Condition D
Mechanical	Solvent resistance	MIL-STD-202, Method 215
Environmental	Thermal shock	MIL-STD-883, Method 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	MIL-STD-202, Method 210, Condition I or J

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Mechanical Drawings



Recommended Land Pattern*



*External high-frequency power decoupling is recommended

Scale: None. Dimensions are in mm/inches.

Marking LINE 1: SARONIX YY WW X (Year, Week, Origin)
Marking LINE 2: 12M3456 (Frequency)
Marking LINE 3: • ST1308xxx (Pin 1, Part Number)

**** Exact location of items may vary**

Ordering Information

SaRonix Model **ST1308** **AA** **BB** - **74.2500** **(T)**

Stability Tolerance
 AA = ±20ppm, 0 to +70°C
 A = ±25ppm, 0 to +70°C
 B = ±50 ppm, 0 to +70°C
 E = ±50 ppm, -40 to +85°C
 G = ±50 ppm, 0 to +85°C

Frequency (MHz)
 74.2500

Linearity
 B = 10%

Pullability (minimum APR)
 A = ±50 ppm

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