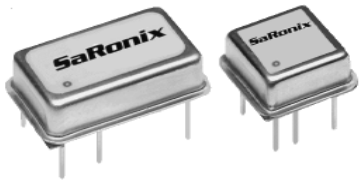
SaRonix

Voltage Controlled Crystal Oscillator

5V, HCMOS

Technical Data

S1500 / S1509 Series



ACTUAL SIZE

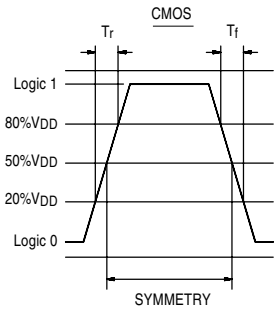
Description

A 5V, voltage controlled crystal oscillator designed primarily to be used in phase locked loops, phase shift keying, jitter reduction and other telecommunication applications. The HCMOS output can drive both high speed CMOS and TTL loads. Devices are packaged in standard 14-pin DIP compatible all metal, resistance welded packages. Pin 7(4 on 1/2 size) is grounded to reduce EMI.

Applications & Features

- 5 Volt operation
- HCMOS / TTL compatible
- 3.5ps max RMS period jitter
- Wide range of performance options available: ±50 to ±200ppm APR*; ±20 to ±50ppm frequency stability
- Tri-State version available
- Gull Wing for IR reflow available

Output Waveform



Frequency Range:	1.5 MHz to 100 MHz (Full Size) 1.5 MHz to 28.6363 MHz (Half Size)
Frequency Stability:	±20, ±25 or ±50 ppm over all conditions: operating temperature, voltage change, load change, calibration tolerance, shock and vibration, with V_C = 2.5V
Aging @ 25°C:	± 3ppm max per year, ±10ppm max for 10 years
Temperature Range:	
Operating:	0 to +70°C or -40 to +85°C
Storage:	-55 to +125°C
Supply Voltage:	
Recommended Operating:	5V ±10%
Supply Current:	
Full Size Package:	1.5 to 12MHz: 20mA max with 30pF load
	12+ to 70MHz: 65mA max with 30pF load
	70+ to 100MHz: 60mA max with 15pF load
Half Size Package:	1.5 to 28.6363MHz: 25mA max with 30pF load
Output Drive:	
Symmetry:	45/55% max @ 50% V_{DD} 1.5 to 70 MHz
	40/60% max @ 50% V_{DD} 70+ to 100 MHz
Rise & Fall Times:	
1.5 to 25 MHz:	8ns max rise, 6ns max fall 20% to 80% V_{DD}, full size package
25+ to 70 MHz:	5ns max, full size package
70+ to 100 MHz:	3ns max, full size package
1.5 to 28.6363 MHz:	6ns max, 1/2 size package
Logic 0:	10% V_{DD} max
Logic 1:	90% V_{DD} min
Load:	30pF, 15pF 70+ to 100 MHz
Jitter:	3.5ps max RMS period jitter
Pull Characteristics:	
Input Impedance (pin 1):	50KΩ min
Frequency Response (-3dB):	10 kHz min
Pullability:	±50, ±100, ±200ppm APR* min, See Part Numbering Guide
Control Voltage:	0.5 to 4.5V
Transfer Function:	Frequency Increases when Control Voltage Increases
Linearity:	5 or 10% max
Center Control Voltage:	2.5V
Mechanical:	
Shock:	MIL-STD-883, Method 2002, Condition B
Solderability:	MIL-STD-883, Method 2003
Terminal Strength:	MIL-STD-202, Method 211, Conditions A & C
Vibration:	MIL-STD-883, Method 2007, Condition A
Solvent Resistance:	MIL-STD-202, Method 215
Resistance to Soldering Heat:	MIL-STD-202, Method 210, Conditions A, B or C (I or J for Gull Wing)
Environmental:	
Gross Leak Test:	MIL-STD-883C, Method 1014, Condition C
Fine Leak Test:	MIL-STD-883C, Method 1014, Condition A2
Thermal Shock:	MIL-STD-883C, Method 1011, Condition A
Moisture Resistance:	MIL-STD-883C, Method 1004

* APR = (VCXO Pull relative to specified Output Frequency) – (VCXO Frequency Stability) – (Aging)

aging is inclusive on the 1/2 size version

SaRonix 141 Jefferson Drive • Menlo Park, CA 94025 • USA • 650-470-7700 • 800-227-8974 • Fax 650-462-9894

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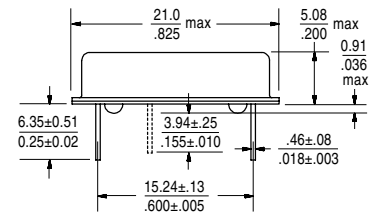
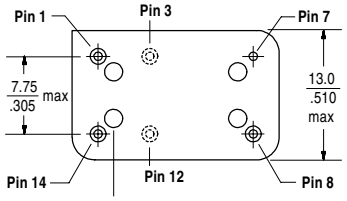
Package Details

0.2" HIGH, FULL SIZE PACKAGE



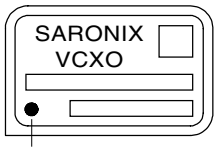


(4) Glass Insulators

Pin Function:

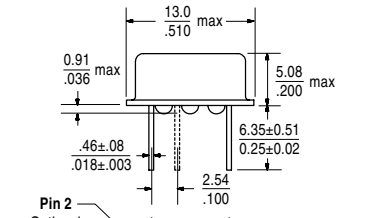
Pin 1: Control Voltage
Pin 3: Tri-State control (optional)
Pin 7: GND/Case (V_{SS})
Pin 8: OUTPUT
Pin 12: N/C (optional)
Pin 14: +5VDC (V_{DD})

Marking Format**
Includes Date Code, Frequency & Model



Denotes Pin 1

HALF SIZE PACKAGE



Marking Format**
Includes Date Code, Frequency & Model

Denotes Pin 1

**Exact location of items may vary

Scale: None (Dimensions in $\frac{mm}{inches}$)

Part Numbering Guide

S T 150 9 A A A K - 19.4400

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Blank = Non Tri-State
T = Tri-State

Supply Voltage
150 = 5V

Package Size
0 = Full Size
9 = 1/2 Size (28.6363 MHz max)

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

Pullability (min APR)**
A = ±50ppm*
B = ±100ppm*
C = ±200ppm*(available at certain frequencies only, please contact SaRonix)

Linearity
A = 5%
B = 10%

Lead/Package Types*
Blank = full 0.3"(not shown) / half 0.2" high
L = full 0.2" high
J = gull wing: full / half 0.2" high(not shown)
K = gull wing: full 0.3" high(not shown)

Frequency (MHz)

*Products are available with the following combination of Frequency, Pull and Package

Frequency	Pullability	Package/Lead Types
1.5 to 28.6363MHz	A, B	L, J
	C	Blank(0.3" full size), K
28.6363+ to 100MHz	A, B, C	Blank(0.3" full size), K

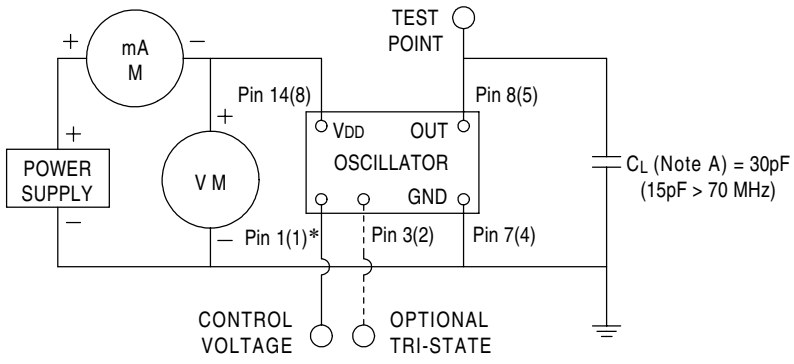
** APR = (VCXO Pull relative to specified Output Frequency) – (VCXO Frequency Stability) – (Aging)
aging is inclusive on the 1/2 size version

Tri-State Logic Table

Pin 3(2) Input	Pin 8(5) Output
Logic 1 or NC	Oscillation
Logic 0 or GND	High Impedance

Required Input Levels on Pin 3(2):
Logic 1 = 3.0 V_{DD} min
Logic 0 = 0.5 V_{DD} max

Test Circuit



NOTE A: C_L includes probe and fixture capacitance
* Items in brackets( ) represent Half Size model

All specifications are subject to change without notice.

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