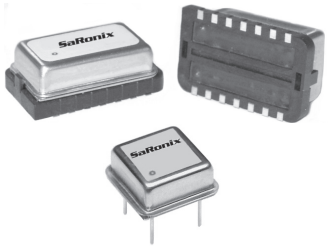
SaRonix

Voltage Controlled Crystal Oscillator

5V, HCMOS

Technical Data

S150x / ST150x Series



ACTUAL SIZE

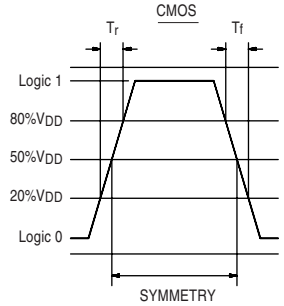
Description

A voltage controlled crystal oscillator designed with excellent Jitter characteristics - ideal for telecom applications. The HCMOS output can drive high speed CMOS & TTL loads. Devices are in standard 14-pin DIP metal packages. Pin 7(4 on 1/2 size) is grounded to reduce EMI. SMD DIL 14 version is available utilizing adaptor technology (see separate data sheet for dimensions).

Applications & Features

- Phase Locked Loop (PLL) Clock & Data Recovery, Frequency Translation, Frequency Synthesis in Video, Video Compression, Telephony, and LAN/ WAN Data Communication and other Telecommunication applications.
- HCMOS / TTL compatible
- 3.5ps max RMS period jitter
- ± 50, 100 or 200 ppm APR*
- ± 20, 25 or 50 ppm Stability
- Tri-State option available
- SMD versions 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 11.9MHz: 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:	20% to 80% V_{DD}
1.5 to 25 MHz:	8ns max rise, 6ns max fall, full size package
25+ to 70 MHz:	5ns max rise & fall, full size package
70+ to 100 MHz:	3ns max rise & fall, full size package
1.5 to 28.6363 MHz:	6ns max rise & fall, half size package
Logic 0:	10% V_{DD} max
Logic 1:	90% V_{DD} min
Load:	30pF to 70 MHz, 15pF from 70+ to 100 MHz
Period Jitter RMS:	3.5ps max
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-883, Method 2004, Conditions B2
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 or SMD)
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)

10 years aging is inclusive on 1/2 size version

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Technical Data

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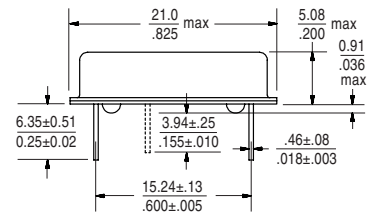
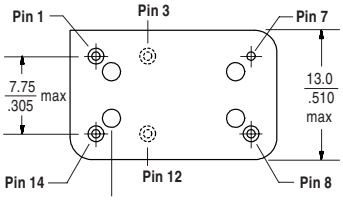
Package Details

0.2" HIGH, FULL SIZE PACKAGE





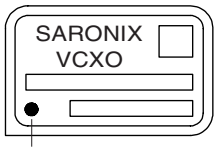
(4) Glass Insulators

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: VDC (V_{DD})

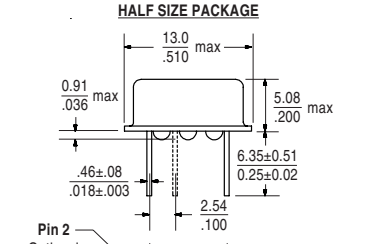
Marking Format**

Includes Date Code, Frequency, Part Number



Denotes Pin 1

HALF SIZE PACKAGE



Marking Format**

Includes Date Code, Frequency, Part Number

Denotes Pin 1

**Exact location of items may vary

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

Part Numbering Guide

S T 1509 A A A K - 19.4400 (T)

SaRonix

Blank = Non Tri-State
T = Tri-State

Package Size
1500 = Full Size
1509 = 1/2 Size to 28.6363 MHz

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*(contact SaRonix for available frequencies)

Linearity
A = 5%
B = 10%

Package Options*
If Full Size Package (S1500)
Blank = Standard 0.3" high, Thru-hole(not shown)
L = 0.2" high, Thru-hole
J = 0.2" high, Gull Wing (not shown)
K = 0.3" high, Gull Wing (not shown)
S = 0.2" high, with True SMD Adaptor (not shown)
U = 0.3" high, with True SMD Adaptor (not shown)
If Half Size Package (S1509)
Blank = Standard 0.2" high, Thru-hole
J = 0.2" high, Gull Wing (not shown)

Frequency (MHz)

Packing Method
(T) = Tape & Reel, SMD versions full reel increments only (200pcs)
Blank = Bulk

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

Frequency	Pullability	Full Size (S1500)	Half Size (S1509)
1.5 to 28.6363MHz	A, B	L, J, S	Standard, J
	C	Standard, K, U	
28.6363+ to 100MHz	A, B, C	Standard, K, U	

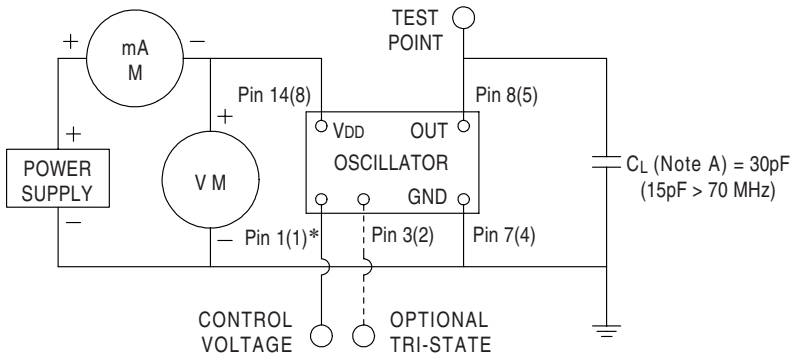
** APR = (VCXO Pull relative to specified Output Frequency) – (VCXO Frequency Stability) – (Aging)
10 years aging is inclusive on 1/2 size version

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 = 3.0V min
Logic 0 = 0.5V max

Test Circuit



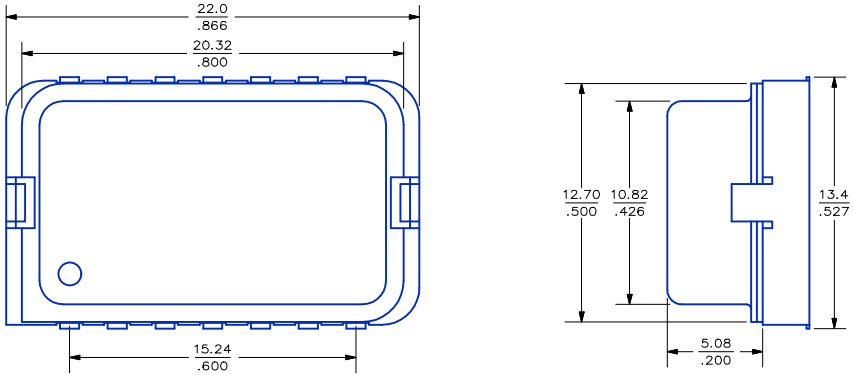
NOTE A: C_L includes probe and fixture capacitance. *Items in brackets( ) represent Half Size model

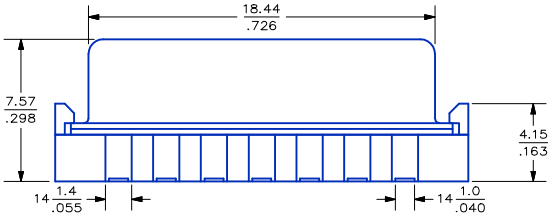
All specifications are subject to change without notice.

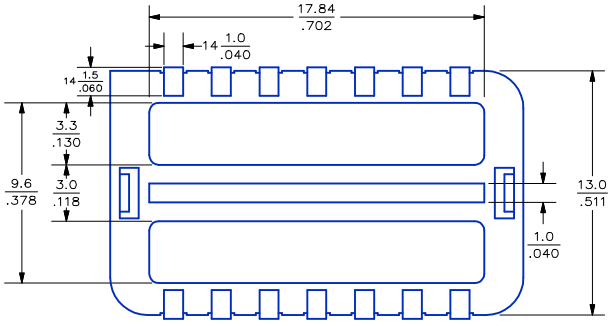
DS-197 REV E

True SMD Adaptor - 7.57mm High

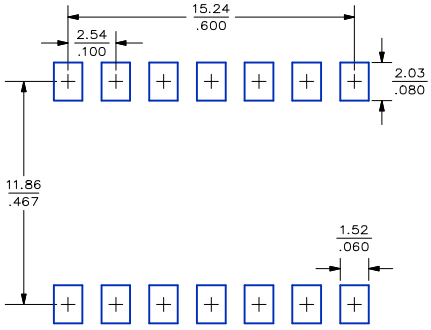
Technical Data







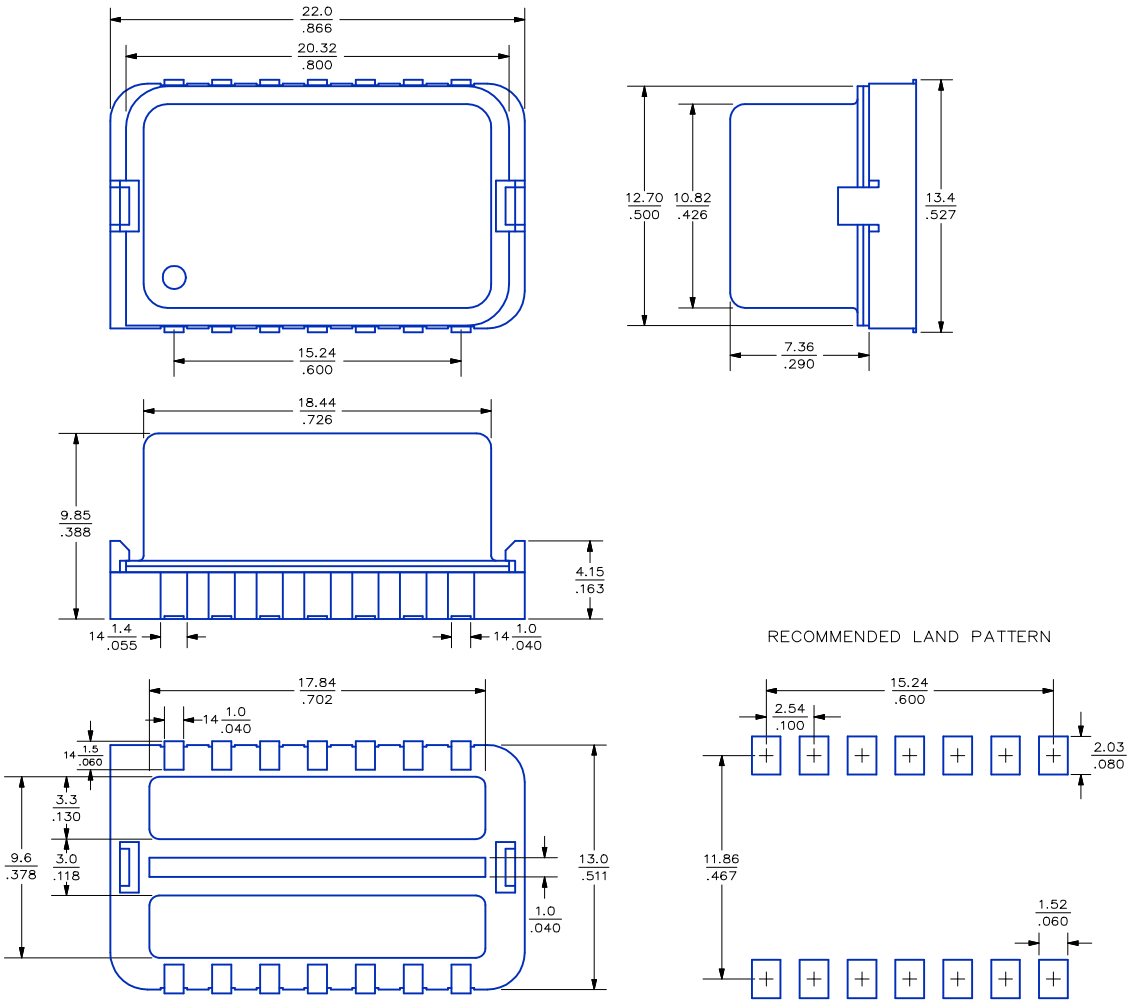
RECOMMENDED LAND PATTERN



REV A

True SMD Adaptor - 9.85mm High

Technical Data



REV A