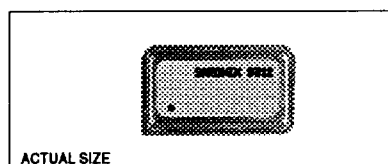
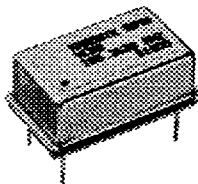


### Technical Data

### S1500 Series



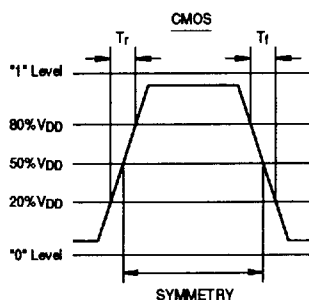
#### Description

A voltage controlled crystal oscillator designed primarily for use in phase locked loops, phase shift keying and other telecommunication applications. The HCMOS output can drive both high speed CMOS and TTL loads. Device is packaged in standard 14-pin DIP compatible all metal, resistance welded package. Pin 7 is grounded to reduce RFI.

#### Applications & Features

- HCMOS & TTL compatible
- Double sealed design for higher reliability
- Wide range of performance options available:  $\pm 50$  to  $\pm 200$  ppm APR\*; 5 to 20% linearity
- Tri-state version available

#### Output Waveform



|                             |                                                                                                             |
|-----------------------------|-------------------------------------------------------------------------------------------------------------|
| <b>Frequency Range:</b>     | 1.5 MHz to 100 MHz                                                                                          |
| <b>Frequency Stability:</b> | $\pm 25$ or $\pm 50$ ppm over all conditions: operating temperature, voltage change, load change and aging. |
| <b>Temperature Range:</b>   |                                                                                                             |
| Operating:                  | 0°C to 70°C (-40°C to +85°C available)                                                                      |
| Storage:                    | -55°C to +125°C                                                                                             |

|                        |                  |
|------------------------|------------------|
| <b>Supply Voltage:</b> |                  |
| Recommended Operating: | +5VDC $\pm 10\%$ |
| Absolute Maximum:      | +7VDC            |

|                        |                                     |
|------------------------|-------------------------------------|
| <b>Supply Current:</b> |                                     |
| 1.5 to 11.9 MHz:       | 15mA typical, 20mA maximum          |
| 12 to 70 MHz:          | 65mA maximum                        |
| Above 70 MHz:          | 60mA maximum with 10 pF output load |

|                      |                                            |
|----------------------|--------------------------------------------|
| <b>Output Drive:</b> |                                            |
| Symmetry:            | 50 $\pm 5\%$ at .5VDD                      |
| Rise & Fall Times:   | 20% to 80% VDD: $T_r / T_f = 4$ ns maximum |
| Logic "0":           | 10% VDD maximum                            |
| Logic "1":           | 90% VDD minimum                            |
| Output Load:         | 30 pF                                      |

|                              |                                                                                                                         |
|------------------------------|-------------------------------------------------------------------------------------------------------------------------|
| <b>Pull Characteristics:</b> |                                                                                                                         |
| Input Impedance (pin 1):     | Greater than 50K $\Omega$                                                                                               |
| Frequency Response (-3dB):   | 10 kHz minimum                                                                                                          |
| Pullability:                 | $\pm 50$ , $\pm 100$ , $\pm 200$ ppm APR*                                                                               |
| Control Voltage:             | 0.5 to 4.5V                                                                                                             |
| Transfer Function:           | Frequency increases when Control Voltage increases                                                                      |
| Linearity:                   | 5, 10 or 20%                                                                                                            |
| Center Control Voltage:      | 2.0V minimum, 3.0V maximum<br>(Control Voltage to achieve specified center frequency ( $f_0$ ) at 25°C $\pm 5^\circ$ C) |

|                               |                                             |
|-------------------------------|---------------------------------------------|
| <b>Mechanical:</b>            |                                             |
| Shock:                        | MIL-STD-883, Method 2002, Condition B       |
| Solderability:                | MIL-STD-883, Method 2003                    |
| Terminal Strength:            | MIL-STD-202, Method 211, Conditions A and 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, Condition B        |

|                       |                                                                            |
|-----------------------|----------------------------------------------------------------------------|
| <b>Environmental:</b> |                                                                            |
| Gross Leak Test:      | MIL-STD-883, Method 1014, Condition C                                      |
| Fine Leak Test:       | MIL-STD-883, Method 1014, Condition A2<br><5 x 10 <sup>-8</sup> ATM cc/sec |
| Thermal Shock:        | MIL-STD-883, Method 1011, Condition A                                      |
| Moisture Resistance:  | MIL-STD-883, Method 1004                                                   |

\*Absolute Pull Range (APR) = (VCXO Pull relative to specified Output Frequency) - (Combined VCXO Frequency Stability and Frequency Accuracy)

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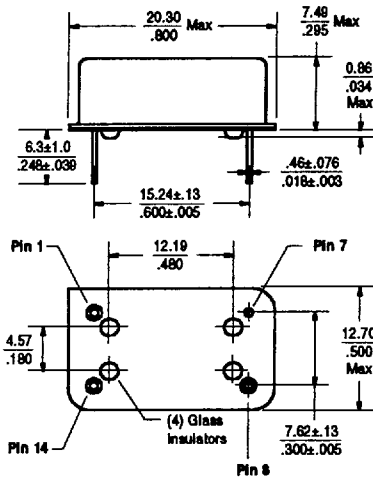
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### Technical Data

### S1500 Series

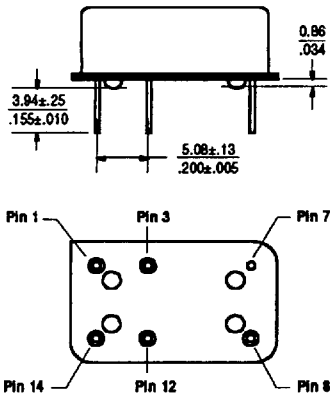
#### Package Details



#### Pin Function:

Pin 1: Control Voltage  
Pin 3: Output  
Pin 7: GND/Case (Vss)  
Pin 14: +5VDC (VDD)

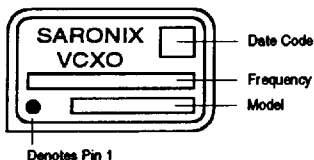
#### Tri-State Package (Optional)



#### Pin Function:

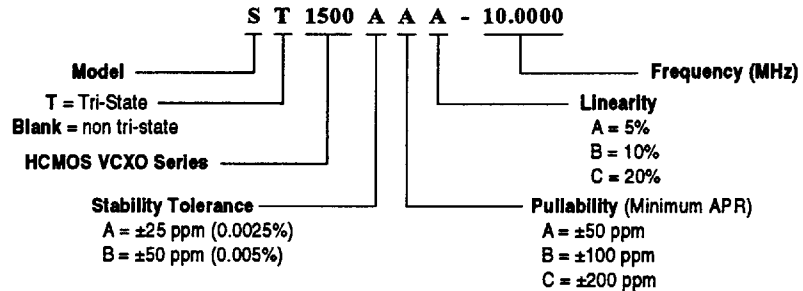
Pin 1: Control Voltage  
Pin 3: Tri-State Control  
Pin 7: GND/Case (Vss)  
Pin 12: N/C  
Pin 14: +5VDC (VDD)

#### Standard Marking Format



Scale: None (Dimensions in mm inches)

#### Part Numbering Guide



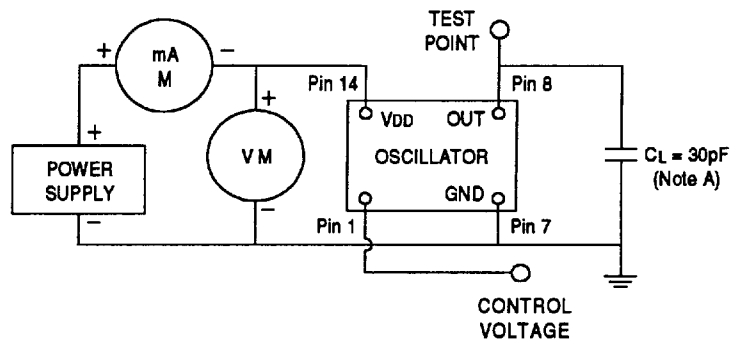
#### Tri-State Logic Table

| Pin 3 Input      | Pin 8 Output   |
|------------------|----------------|
| Logic "1" or NC  | Oscillation    |
| Logic "0" or GND | High Impedance |

#### Required Input Levels on Pin 3:

Logic "1" = 3.0V min  
Logic "0" = 0.5V max

#### Test Circuit



NOTE A:  $C_L$  includes probe and fixture capacitance

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All specifications are subject to change without notice.

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