# SaRonix

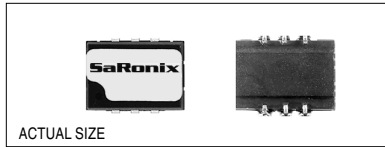## Voltage Controlled Crystal Oscillator    3.3V, CMOS / TTL
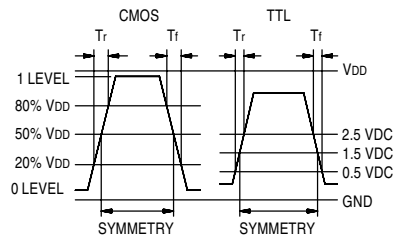
# Technical Data

ACTUAL SIZE

### Description

A voltage controlled crystal oscillator, with output logic levels compatible with HCMOS and TTL logic families. The 6-pin, plastic molded SMD, J- leaded package ("S" package) is ideal for today's automated assembly environments.

### Applications

- For use with phase-locked loop (PLL) for clock and data recovery, frequency translation, or frequency synthesis applications in video, telephony, and data communication environments.
- Compact, plastic molded SMD package
- TTL and CMOS compatible
- Tri-state output

### Output Waveform



| | |
|---|---|
| **Frequency Range:** | 1.5 MHz to 27 MHz |
| **Frequency Stability:** | ±50 ppm over all conditions: operating temperature, voltage change, load change, calibration tolerance, with $V_C$ = 1.65V |
| **Aging:** | ±12ppm max in 10 Years @ +40°C |

**Temperature Range:**

| | |
|---|---|
| Operating: | 0 to +70°C, -40 to +85°C |
| Storage: | -55 to +125°C |

**Supply Voltage:**

| | |
|---|---|
| Recommended Operating: | 3.3V ±10% |

**Supply Current:**  15mA max

**Output:**

| | |
|---|---|
| Symmetry: | 45/55% max @ 50% $V_{DD}$ |
| Rise & Fall Times: | 9ns max 20% to 80% $V_{DD}$ |
| Logic 0: | 10% $V_{DD}$ max |
| Logic 1: | 90% $V_{DD}$ min |
| Load: | 30pF |
| Jitter: | 20ps peak-to-peak max |

**Pull Characteristics:**

| | |
|---|---|
| Input Impedance: | 50KΩ min |
| Frequency Response (-3dB): | 10kHz |
| Pullability: | ±25ppm, ±50ppm, ±75ppm APR* (See Part Numbering Guide) |
| Control Voltage: | 0.3 to 3V |
| Transfer Function: | Frequency increases when Control Voltage increases |
| Linearity: | 10% max |
| Center Control Voltage: | 1.65V |

**Mechanical:**

| | |
|---|---|
| Shock: | MIL-STD-883, Method 2002, Condition B |
| Solderability: | MIL-STD-883, Method 2003 |
| Terminal Strength: | MIL-STD-883, Method 2004, Condition B2 |
| Vibration: | MIL-STD-883, Method 2007, Condition A |
| Resistance to Soldering Heat: | MIL-STD-202, Method 210, Condition I or J |

**Environmental:**

| | |
|---|---|
| Thermal Shock: | MIL-STD-883, Method 1011, Condition A |
| Moisture Resistance: | MIL-STD-883, Method 1004 |

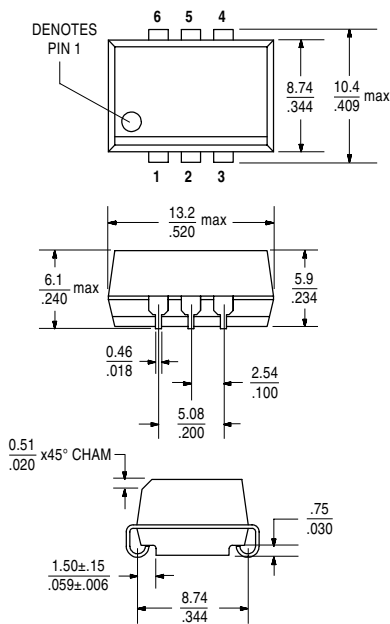**∗** APR = (VCXO Pull relative to specified Output Frequency) – (VCXO Frequency Stability) – (Aging)

## Voltage Controlled Crystal Oscillator    3.3V, CMOS / TTL

# Technical  Data

**S1328 Series**

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### Tri-State Logic Table

| Pin 2 Input | Pin 4 Output |
|---|---|
| Logic 1 or NC | Oscillation |
| Logic 0 or GND | High Impedance |

Required Input Levels on Pin 2:
Logic 1 = 2.4V min
Logic 0 = 0.5V max

### Package Details



DENOTES PIN 1

6  5  4

1  2  3

$\frac{8.74}{.344}$    $\frac{10.4}{.409}$ max

$\frac{13.2}{.520}$ max

$\frac{6.1}{.240}$ max    $\frac{5.9}{.234}$

$\frac{0.46}{.018}$    $\frac{2.54}{.100}$

$\frac{5.08}{.200}$

$\frac{0.51}{.020}$ x45° CHAM

$\frac{.75}{.030}$
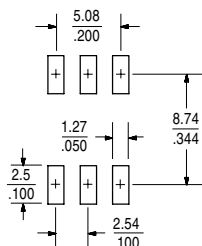
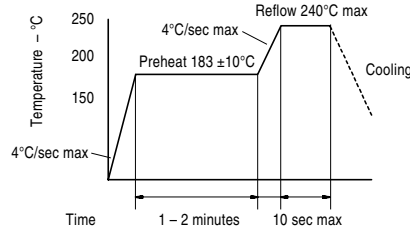$1.50\pm.15$ / $.059\pm.006$

$\frac{8.74}{.344}$

**Pin Functions:**
Pin 1: Control Voltage   Pin 4: Output
Pin 2: Tri-State Control   Pin 5: N/C
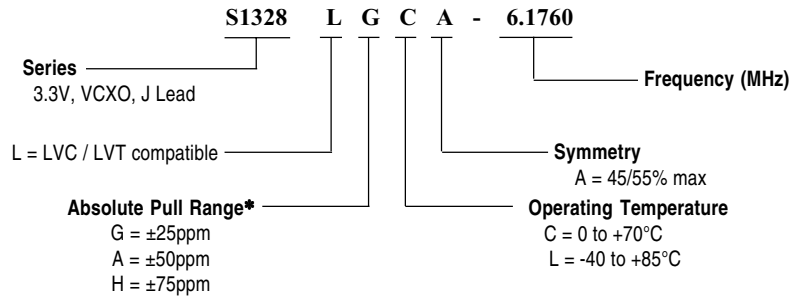Pin 3: GND   Pin 6: +3.3VDC

Scale: None  (Dimensions in $\frac{mm}{inches}$)
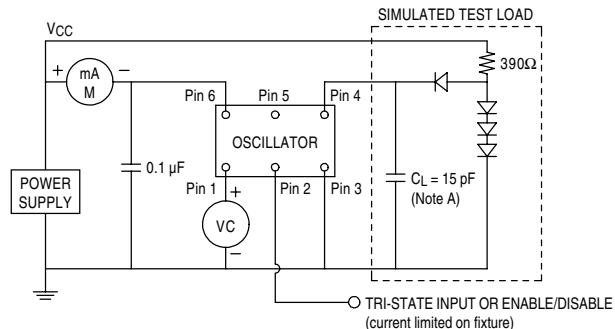
### Recommended Land Pattern



$\frac{5.08}{.200}$

$\frac{8.74}{.344}$

$\frac{1.27}{.050}$

$\frac{2.5}{.100}$

$\frac{2.54}{.100}$

### Solder Reflow Guide



Temperature – °C

250
200
150

4°C/sec max

Preheat 183 ±10°C

4°C/sec max

Reflow 240°C max

Cooling

Time    1 – 2 minutes    10 sec max

### Part Numbering Guide

**S1328   L   G   C   A  -  6.1760**

**Series**
3.3V, VCXO, J Lead

L = LVC / LVT compatible

**Absolute Pull Range✱**
G = ±25ppm
A = ±50ppm
H = ±75ppm

**Frequency (MHz)**

**Symmetry**
A = 45/55% max

**Operating Temperature**
C = 0 to +70°C
L = -40 to +85°C

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

### Test Circuits



SIMULATED TEST LOAD

$V_{CC}$

mA M

Pin 6   Pin 5   Pin 4

OSCILLATOR

Pin 1   Pin 2   Pin 3

VC

POWER SUPPLY

0.1 µF

390Ω

$C_L$ = 15 pF (Note A)

TRI-STATE INPUT OR ENABLE/DISABLE
(current limited on fixture)

NOTE A:  $C_L$ includes probe and jig capacitance.
**TTL TEST CIRCUIT**



mA M

Pin 6   Pin 5   Pin 4

OSCILLATOR

Pin 1   Pin 2   Pin 3

VC

POWER SUPPLY

0.1 µF

$C_L$ = 30 pF  (Note A)

TRI-STATE INPUT OR ENABLE/DISABLE
(current limited on fixture)
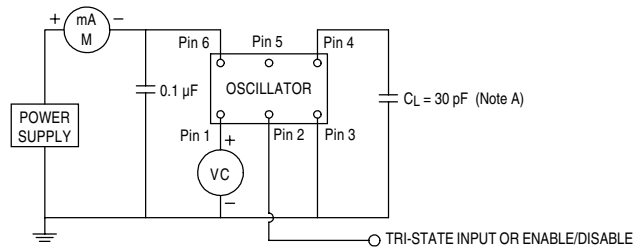
NOTE A:  $C_L$ includes probe and jig capacitance.
**HCMOS TEST CIRCUIT**

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DS-194    REV A

**5.10.2**