

Actual Size = 3.2 x 5mm



#### Product Features

- Less than 1.5 ps RMS jitter with fundamental or overtone design
- 1.8V CMOS compatible logic levels
- Pin-compatible with standard 3.2x5mm packages
- Designed for standard reflow and washing techniques
- Low power standby mode: 10 uA max
- Pb-free and RoHS/Green compliant

#### Product Description

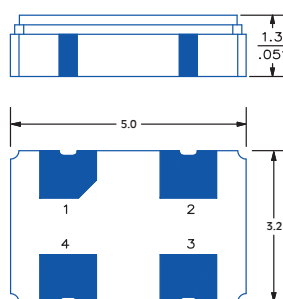
The S1632 Series is a 1.8V crystal clock oscillator that achieves superb jitter and stability over a broad range of operating conditions and frequencies. The output clock signal, generated internally with a non-PLL oscillator design, is compatible with LVCMOS logic levels. The device, available on tape and reel, is contained in a 3.2x5mm surface-mount ceramic package.

#### Applications

The S1632 Series is an ideal reference clock for compact, high-density applications requiring low jitter tight stability, or low power consumption, including:

- Ethernet
- HBA
- Portable Multimedia Player (PMP)
- Notebook Computer
- Hard Disk Drive

#### Packaging Outline



#### Pin Functions

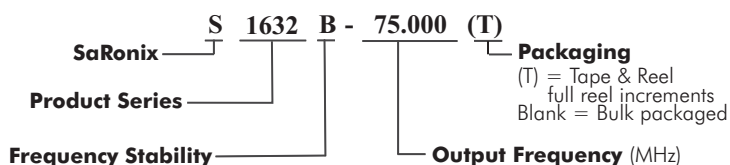
| Pin | Function        |
|-----|-----------------|
| 1   | OE Function     |
| 2   | Ground          |
| 3   | Clock Output    |
| 4   | V <sub>DD</sub> |

#### Common Frequencies

Contact SaRonix for additional frequencies

|             |             |              |
|-------------|-------------|--------------|
| 2.0480 MHz  | 24.0000 MHz | 50.0000 MHz  |
| 3.6864 MHz  | 24.5760 MHz | 60.0000 MHz  |
| 8.0000 MHz  | 25.0000 MHz | 66.0000 MHz  |
| 10.0000 MHz | 27.0000 MHz | 66.6667 MHz  |
| 14.3181 MHz | 32.0000 MHz | 75.0000 MHz  |
| 16.0000 MHz | 33.0000 MHz | 80.0000 MHz  |
| 19.4400 MHz | 40.0000 MHz | 90.0000 MHz  |
| 20.0000 MHz | 48.0000 MHz | 100.0000 MHz |

#### Ordering Information



\*A = ±25 ppM (-20 to +70 °C)  
B = ±50 ppM (-2 to +70 °C)  
\*E = ±50 ppM (-40 to +85°C)

\* Availability varies by frequency.

**Electrical Performance**

| Parameter                      | Min.                | Typ. | Max.                | Units        | Notes                          |
|--------------------------------|---------------------|------|---------------------|--------------|--------------------------------|
| Output frequency               | 1.5440              |      | 100                 | MHz          | As specified                   |
| Supply voltage                 | 1.71                | 1.8  | 1.89                | V            |                                |
| Supply current, output enabled |                     |      | 4                   | mA           | 1.5440 to <36 MHz              |
|                                |                     |      | 7                   |              | 36 to <50 MHz                  |
|                                |                     |      | 10                  |              | 50 to <70 MHz                  |
|                                |                     |      | 20                  |              | 70 to 100 MHz                  |
| Standby current                |                     |      | 10                  | μA           | 1.5440 to <36MHz               |
|                                |                     |      | 100                 | uA           | 36 to 100MHz                   |
| Frequency stability            |                     |      | ±25 to ±50          | ppM          | See Note 1 below               |
| Operating temperature          | -40                 |      | +85                 | °C           | As specified                   |
| Output logic 0, VOL            |                     |      | 10% V <sub>DD</sub> | V            |                                |
| Output logic 1, VOH            | 90% V <sub>DD</sub> |      |                     | V            |                                |
| Output load                    | 15 pF (max)         |      |                     |              |                                |
| Duty cycle                     | 45                  |      | 55                  | %            | measured 50%VDD                |
| Rise and fall time             | <36 MHz             |      | 4                   | ns           | measured 20/80% of waveform    |
|                                | 36 to 100 MHz       |      | 2.5                 |              |                                |
| Jitter, Phase                  | up to 75 MHz        |      | 1.5                 | ps RMS (1-σ) | 10kHz to 20 MHz frequency band |
|                                | 75 to 100 MHz       |      | 1                   |              |                                |
| Jitter, Accumulated            | up to <75 MHz       |      | 5                   | ps RMS (1-σ) | 20.000 adjacent periods        |
|                                | 75 to 100 MHz       |      | 3                   |              |                                |
| Jitter, Total                  | up to <75 MHz       |      | 50                  | ps pk-pk     | 100.000 random periods         |
|                                | 75 to 100 MHz       |      | 30                  |              |                                |

**Notes:**

- As specified. Stability includes all combinations of operating temperature, load changes, rated input (supply) voltage changes, initial calibration tolerance (25°C), aging (1 year at 25°C average effective ambient temperature), shock and vibration.

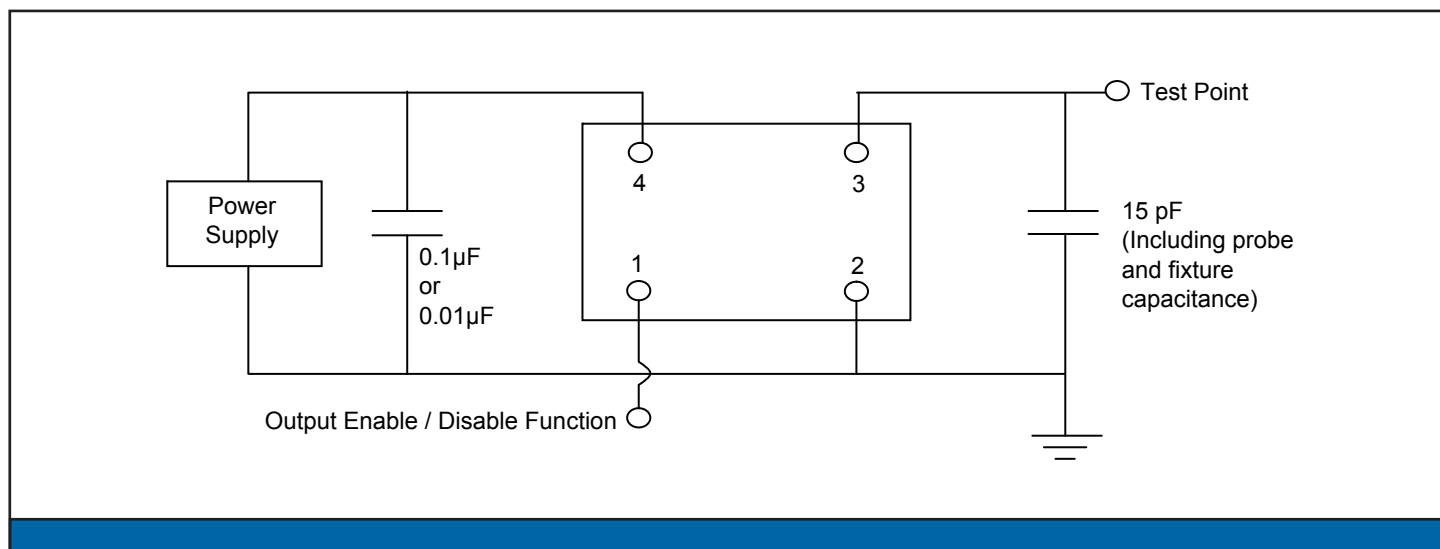
**Output Enable / Disable Function**

| Parameter   | Min.                | Typ. | Max.                | Units | Notes          |
|---|---------------------|------|---------------------|-------|----------------|
| Input Voltage (pin 1), Output Enable                      | 0.7 V <sub>DD</sub> |      |                     | V     | or open        |
| Input voltage (pin 1), Output Disable (low power standby) |                     |      | 0.3 V <sub>DD</sub> | V     | Output is Hi-Z |
| Internal pullup resistance                                | 30                  |      |                     | kΩ    |                |
| Output disable delay                                      |                     |      | 200                 | ns    |                |
| Output enable delay                                       |                     |      | 10                  | ms    |                |

**Absolute Maximum Ratings**

| Parameter           | Min. | Typ. | Max. | Units | Notes |
|---------------------|------|------|------|-------|-------|
| Storage temperature | -55  |      | +125 | °C    |       |

**Test Circuit**

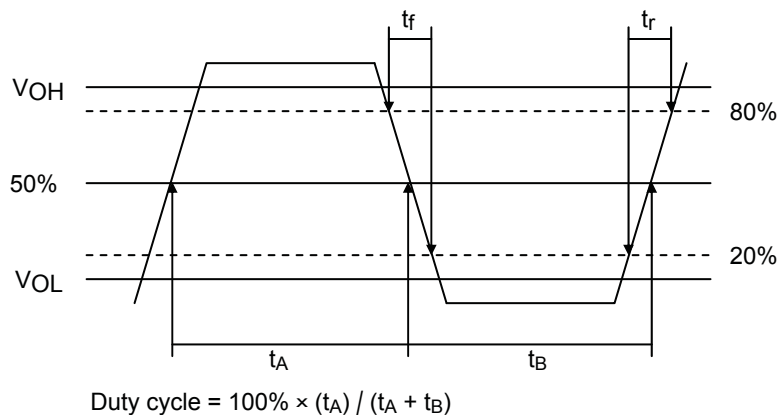


**Reliability Test Ratings**

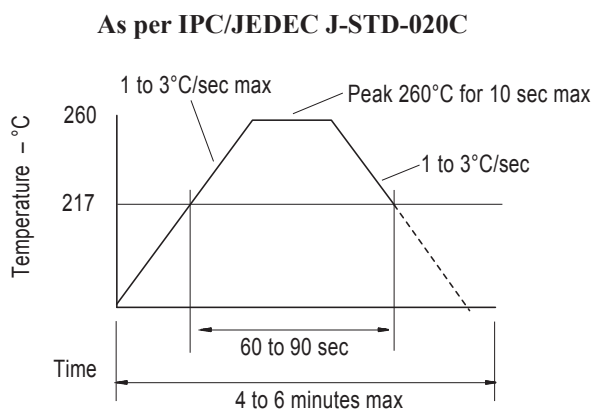
This product is rated to meet the following test conditions:

| Type          | Parameter                    | Test Condition  |
|---------------|------------------------------|---|
| Mechanical    | Shock                        | MIL-STD-883, Method 2002, Condition B                                       |
| Mechanical    | Solderability                | JESD22-B102-D Method 2 (Preconditioning E)                                  |
| Mechanical    | Terminal strength            | MIL-STD-883, Method 2004, Condition D                                       |
| Mechanical    | Gross leak                   | MIL-STD-883, Method 1014, Condition C                                       |
| Mechanical    | Fine leak                    | MIL-STD-883, Method 1014, Condition A2 ( $R_1 = 2 \times 10^{-8}$ atm cc/s) |
| 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 | J-STD-020C Table 5-2 Pb-free devices (2 cycles max)                         |

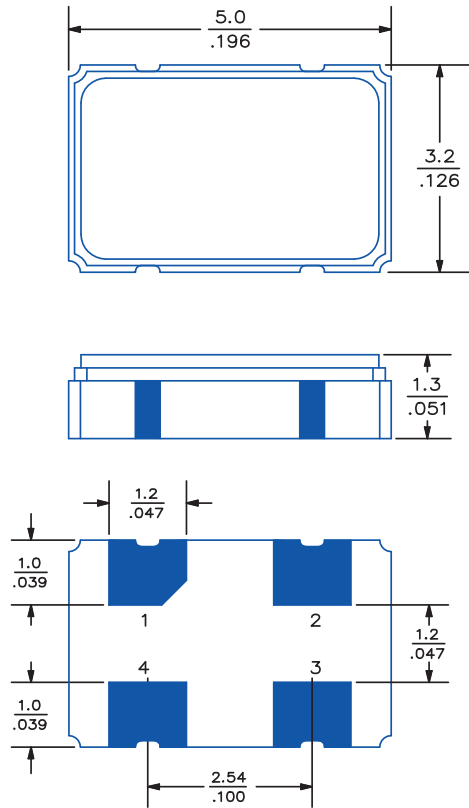
**Output Waveform**



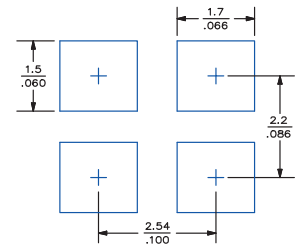
**Reflow Soldering Profile**



**Mechanical Drawings**



**Recommended Land Pattern\***



\*External high-frequency power decoupling is recommended.(see test circuit for minimum recommendation). To ensure optimal performance, do not route traces beneath the package.

Scale: None. Dimensions are in mm/inches.

**Marking LINE 1:** S 2 X (SaRonix, Model, Stability code)  
**Marking LINE 2:** Frequency (Frequency code)  
**Marking LINE 3:** ● YY WW X (Pin 1, Year, Week, Origin)

\*\*Exact location of markings may vary.