

Actual Size



#### Product Description

The crystals are miniature AT or BT cut strip resonators housed in low profile packages for surface mounting. The parts present a proven metal package technology with a precision molded base and universal contact configuration.

#### Product Features

- 49SNC is interchangeable with popular molded crystal configurations.
- Lead (Pb)-free RoHS Compliant Version Available

#### Typical Applications

- Set-Top Box
- Clock/VCXO Multiplier
- Fibre Channel
- Ethernet
- Modems
- ADSL
- ISDN
- Microcontrollers
- Remote control devices
- Network processors
- Audio/Video

#### Frequency Range:

- 3.2 to 29.999 MHz, AT Fundamental
- 26.8 to 50.000 MHz, BT Fundamental
- 30.0 to 80.000 MHz, AT 3rd OT

#### Temperature Range:

- Operating: -20 to +70°C Standard (see options below)
- Storage: -55 to +125°C

#### Temperature Stability Tolerance:

- $\pm 30$ ppm, -20 to +70°C
- $\pm 50$ ppm, -40 to +85°C, or
- $\pm 100$ ppm, -40 to +85°C
- 0 to -100ppm for BT
- Others available

#### Characteristics at 25°C $\pm 2^\circ\text{C}$ :

- Frequency Calibration Tolerance:  $\pm 30$ ppm,  $\pm 50$ ppm (others avail)
- Load Capacitance: 16 to 32pF or Series Resonance
- Effective Series Resistance: 30 to 200-ohm (frequency dependent)
- Drive Level: 100 $\mu$ W correlation, 500 $\mu$ W Max operating
- Shunt Capacitance: 7pF Max.

#### Mechanical:

- Shock: MIL-STD-883, Method 2002, Condition B
- Solderability: MIL-STD-883, Method 2003
- Solderability: JESD22-B102-D Method 2 (Preconditioning E)
- 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 I or J
- Resistance to Soldering Heat: J-STD-020C Table 5-2 Pb-free devices (3 cycles max)

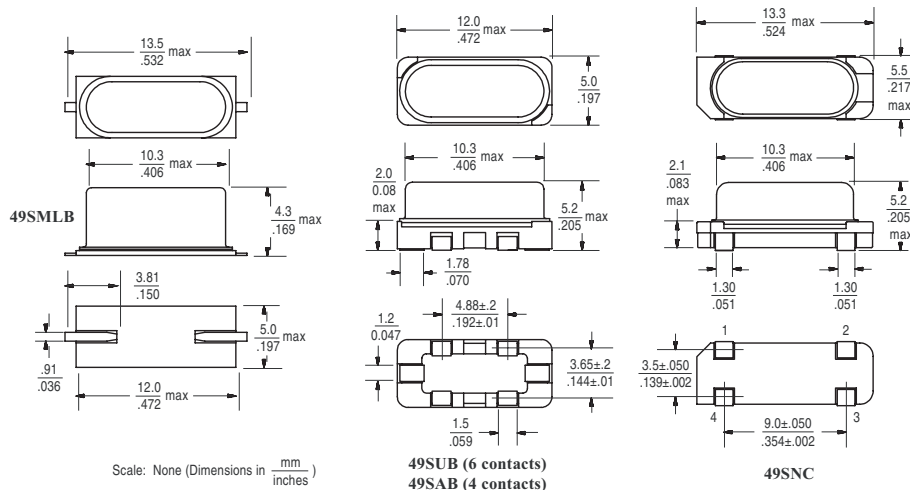
#### Environmental:

- Gross Test Leak: MIL-STD-883, Method 1014, Condition C
- Fine Test Leak: MIL-STD-883, Method 1014, Condition A
- Thermal Shock: MIL-STD-883, Method 1011, Condition A
- Moisture Resistance: MIL-STD-883, Method 1004

#### Reflow Temperature:

- Standard: 240°C Max
- Lead-free: 260°C Max, 10 sec max

**Packaging Information: HC-49**

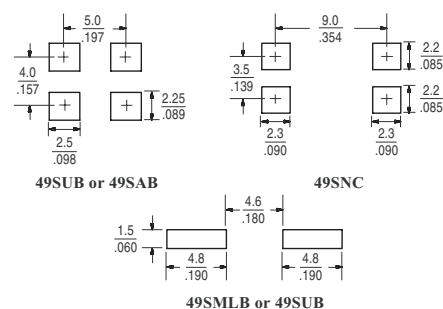


**Package Marking Information**

Line 1: S = SaRonix  
xxx = Calib/Stability/Temp Code  
YYWWX = Date Code  
Line 2: Frequency (up to 7 digits, including decimal point)  
BT-cut = B or  
AT-cut Parallel = -(dash) or  
AT-cut Series = leave Blank  
xx = Load Capacitance (leave Blank if Series)

SxxxYYWWX  
24.5760-xx

**Land Pattern**



**Ordering Information**

49xxx XXX = XX XXX X (X)

Type / Package  
49SMLB = 2 contact, 4mm high  
49SAB = 4 contact, 5 mm high  
49SNC = 4 contact, 5mm high  
49SUB = 6 contact, 5mm high

Frequency  
Frequency (in MHz) = 0x.xxxx, xx.xxxx  
(a zero is used in front of frequencies under 10 MHz)

B = BT-cut, 26.8 to 50 MHz  
- (dash) = AT-cut Parallel Resonance  
Blank = AT-cut Series Resonance

Load Capacitance  
xx = Parallel Resonance (specify load)  
Blank = Series Resonance

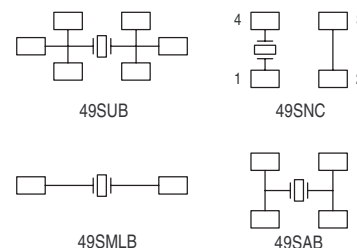
Options  
(T) = Tape and Reel (full increments only) 1000 pieces  
Blank = Bulk

-E (dash E) = Lead (Pb)-free RoHS Compliant Version  
Blank = Standard version

Calibration / Stability / Temp Range  
GGC = ±30ppm / ±30ppm / -20 to +70°C  
GHE = ±30ppm / ±50ppm / -40 to +85°C  
HJE = ±50ppm / ±100ppm / -40 to +85°C  
\*others available

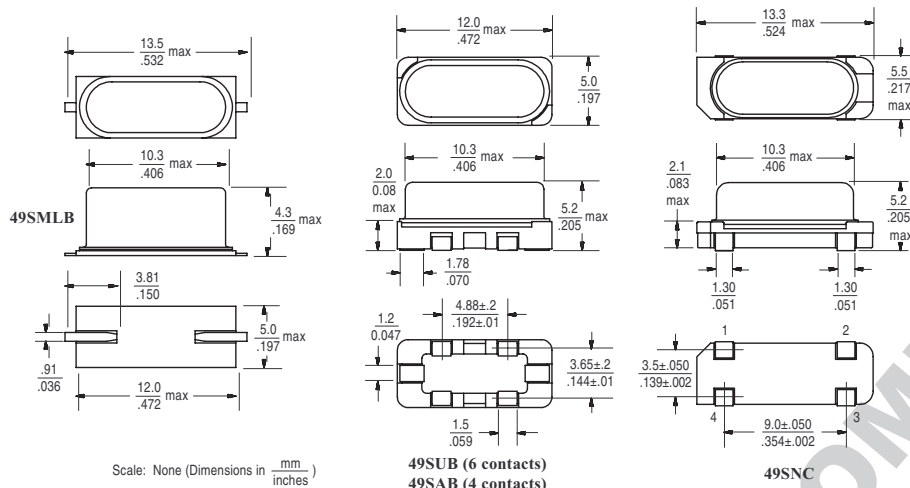
Part Number Examples: Freq 5.1234MHz, ±30ppm calib, ±30ppm stability, -20 to +70°C, 16pF  
= 49SMLB05.1234-16GGC  
= 49SMLB05.1234-16GGC-E (for lead-free)

**Pad Connection Configurations**



**THIS PAGE NOT RECOMMENDED FOR NEW DESIGNS, SEE PAGES 1-2**

**Packaging Information: HC-49**



**Package Marking Information**

**Products with custom frequency, calibration, stability, temp:**

Line 1: S = SaRonix  
-(dash) = separator  
xxx = Calib/Stability/Temp Code  
Line 2: Frequency (up to 7 digits, including decimal point)  
BT-cut = B or  
AT-cut Parallel = -(dash) or  
AT-cut Series = leave Blank  
xx = Load Capacitance (leave Blank if Series)

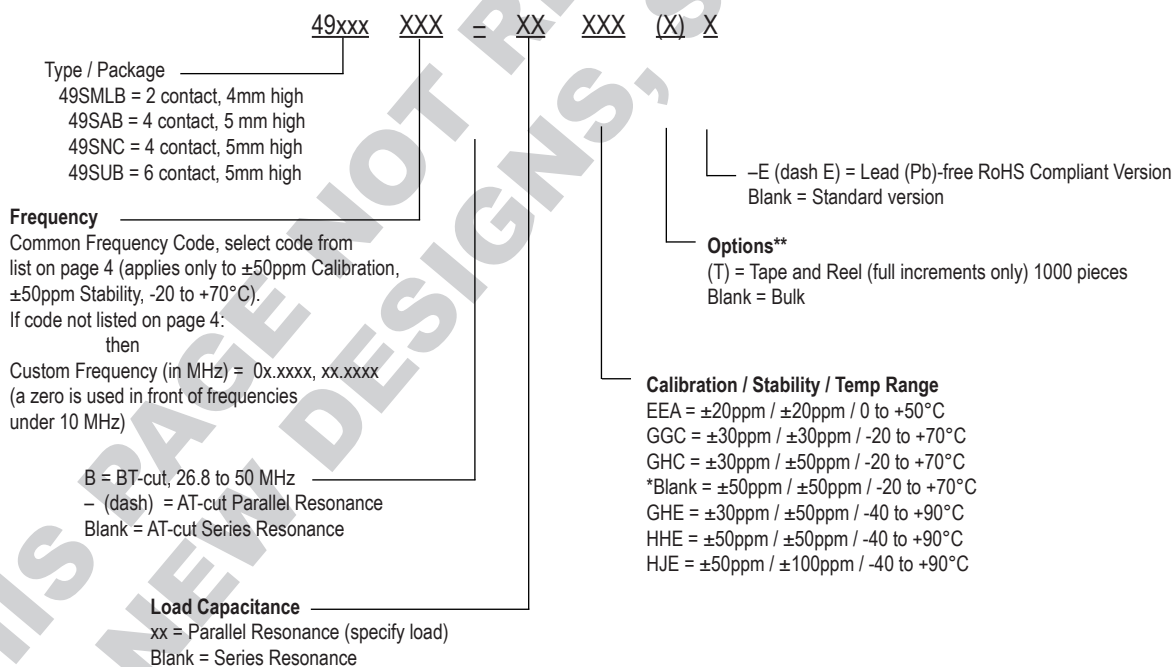
S-xxxYYWW  
24.5760-xx

**Products with custom frequency and standard specifications:**

Line 1: S = SaRonix  
YYWW = Date Code  
Line 2: Frequency (up to 7 digits, including decimal point)  
BT-cut = B or  
AT-cut Parallel = -(dash) or  
AT-cut Series = leave Blank  
xx = Load Capacitance (leave Blank if Series)

SYWW  
24.5760-xx

**Ordering Information**



\*no code used, as these specs designate standard configuration for this series

**Part Number Examples:**

Common Freq 20MHz,  $\pm 50$ ppm calib,  $\pm 50$ ppm stability, -20 to +70°C, 12pF = 49SMLB200-12-E (lead free)

Common Freq 20MHz,  $\pm 50$ ppm calib,  $\pm 50$ ppm stability, -20 to +70°C, Series = 49SMLB200

Custom Freq 5.1234MHz,  $\pm 30$ ppm calib,  $\pm 30$ ppm stability, -20 to +70°C, 16pF = 49SMLB05.1234-16GGC

**THIS PAGE NOT RECOMMENDED FOR NEW DESIGNS, SEE PAGES 1-2**

**Legacy Part Number Format**

**Common frequency codes:**

to be used only with  $\pm 50$ ppm calibration,  $\pm 50$ ppm stability over -20 to +70°C

**Solder Reflow Guide**

| Freq. MHz | Freq. Code | Maximum ESR (Fundamental) | Maximum ESR (3rd OT) |
|-----------|------------|---------------------------|----------------------|
| 3.579545  | 035        | 200                       |                      |
| 3.686400  | 037        | 160                       |                      |
| 4.000000  | 040        | 150                       |                      |
| 4.915200  | 049        | 150                       |                      |
| 5.068800  | 051        | 120                       |                      |
| 6.000000  | 060        | 100                       |                      |
| 7.372800  | 073        | 80                        |                      |
| 8.000000  | 080        | 80                        |                      |
| 10.000000 | 100        | 60                        |                      |
| 11.059200 | 111        | 60                        |                      |
| 12.000000 | 120        | 60                        |                      |
| 12.288000 | 122        | 60                        |                      |
| 14.318180 | 143        | 30                        |                      |
| 15.000000 | 150        | 30                        |                      |
| 16.000000 | 160        | 30                        |                      |
| 18.000000 | 180        | 30                        |                      |
| 18.432000 | 184        | 30                        |                      |
| 19.660800 | 196        | 30                        |                      |
| 20.000000 | 200        | 30                        |                      |
| 24.000000 | 240        | 30                        |                      |
| 24.576000 | 245        | 30                        |                      |
| 25.000000 | 250        | 30                        |                      |
| 26.800000 | 268        | 30                        |                      |
| 28.000000 | 280        | 30                        |                      |
| 29.491200 | 294        | 30                        |                      |
| 30.000000 | 300        | 30                        | 80                   |
| 32.000000 | 320        | 30                        | 80                   |
| 32.256000 | 322        | 30                        | 80                   |
| 33.000000 | 330        | 30                        |                      |
| 33.333000 | 333        | 30                        |                      |
| 33.868000 | 338        | 30                        |                      |
| 35.251200 | 352        | 30                        | 80                   |
| 36.000000 | 360        | 30                        | 80                   |
| 40.000000 | 400        | 30                        | 80                   |
| 40.320000 | 403        | 30                        | 80                   |
| 40.960000 | 409        | 30                        | 80                   |
| 42.000000 | 420        | 30                        | 80                   |
| 42.500000 | 425        | 30                        | 80                   |
| 45.000000 | 450        | 30                        | 80                   |
| 46.000000 | 460        | 30                        | 80                   |
| 48.000000 | 480        | 30                        | 80                   |
| 50.000000 | 500        | 30                        | 80                   |
| 52.416000 | 524        | 30                        | 80                   |
| 56.448000 | 564        | 30                        | 80                   |
| 60.000000 | 600        | 30                        | 80                   |
| 66.666667 | 666        | 30                        | 80                   |

