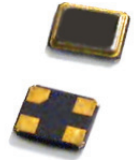


# Miniature Quartz Crystal Ceramic SMD

**FL**



Actual Size



## Product Features

- Rugged AT-cut crystal construction
- Miniature 3.2x2.5mm ceramic package
- Available on tape & reel; 8mm tape, 3000/reel
- Pb-free and ROHS/Green compliant

## Product Description

The 4-pad FL Series devices incorporate a sub-miniature AT-cut crystal resonator housed in a standard 3.2x2.5mm ceramic package. These compact crystals are ideal for surface mounting in densely populated or small form-factor PCB applications.

## Typical Applications

- HDD
- PCMCIA Cards
- Portable / hand-held PCs
- Notebook PC
- GPS
- Bluetooth
- Wireless LAN
- GSM

## Common Frequencies (MHz):

13.5600	20.0000	27.0000	39.0625
14.3181	20.4800	28.6363	40.0000
14.7456	22.1184	31.2500	48.0000
15.3600	24.0000	32.0000	53.1250
16.0000	24.5760	32.7680	54.0000
16.3840	25.0000	33.0000	
19.2000	26.0000	37.5000	

## Frequency Range:

- 12.0000 MHz to 54.0000 MHz (Fundamental)

## Characteristics at 25°C ±2°C:

- Frequency Calibration Tolerance: ±10ppm, ±20ppm, ±30ppm
- Load Capacitance: 10 to 32pF, or series resonance
- Effective Series Resistance:
  - 80Ω max (14 to 19.9 MHz)
  - 60Ω max (20 to 29.9 MHz)
  - 40Ω max (30 to 54 MHz)
- Drive Level: 10μW typ. (100μW max)
- Shunt Capacitance: 5pF Max.

## Temperature Range:

- Operating: -20 to +70°C or -40 to +85°C (as specified)
- Storage: -40 to +85°C

## Temperature Stability (as specified):

- ±10, ±20, ±30, ±50ppm (-20 to +70°C)
- ±30, ±50ppm (-40 to +85°C)

## Aging at 25°C, First Year:

- ±3ppm Typ., ±5ppm Max.

## Mechanical:

- Shock: JESD22-B104 (Condition B)
- Solderability: J-STD-002
- Vibration: JESD22-B103
- Solvent Resistance: JESD22-B107
- Resistance to Soldering Heat: J-STD-020C Table 5-2 Pb-free devices (3 cycles max)

## Environmental:

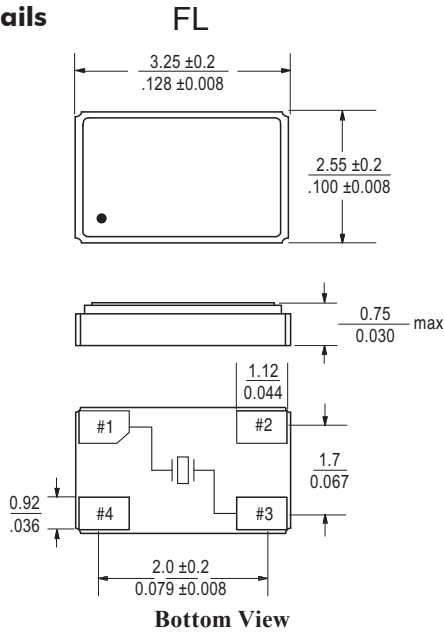
- Gross Test Leak: JESD22-A109 (Condition C)
- Fine Test Leak: JESD22-A109 (Condition A1)
- Moisture Resistance: JESD22-A113

## Reflow Temperature:

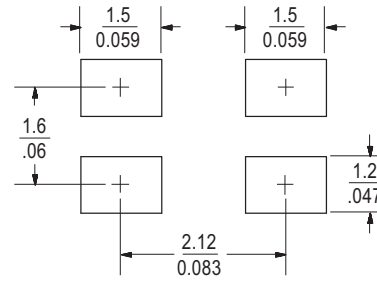
- 260°C Max

## Mechanical Drawings: 3.2 x 2.5 Ceramic

### Package Details



### Recommended Land Pattern



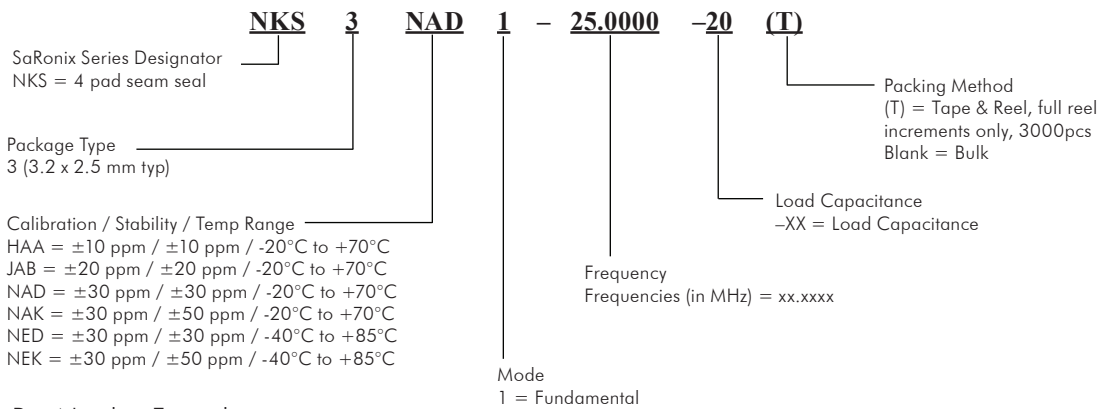
Scale: None (Dimensions  $\frac{\text{mm}}{\text{inches}}$ )

## New Part Number Example

**FL**   **250**   **0001**   A = Product Family  
 ④   ④   ④   B = Frequency Code  
 C = Specification Code

Note: After July 1, 2007, a Saronix - eCera part number following the above format will be assigned upon confirmation of exact customer requirements.

## Legacy Ordering Information



### Part Number Example:

Spec: Freq 18.1234MHz,  $\pm 30$ ppm calib,  $\pm 30$ ppm stab, -20 to +70°C, 16pF, T&R = NKS3NAD1-18.1234-16(T)