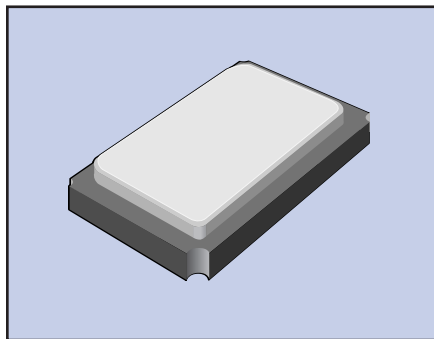




The ECX-32 SMD is our smallest sub-miniature SMD crystal with 3.2 x 2.5 mm footprint. This package is ideal for today's compact wireless applications where board space is critical.

## FEATURES

- Compact and low profile
- Seam-welded package
- Tape & Reel (1,000 pcs.)
- PbFree/RoHS Compliant



## PART NUMBERING GUIDE "EXAMPLE"

| MANUFACTURER | FREQUENCY (16.000 MHz) | LOAD CAPACITANCE* | PACKAGE TYPE** |
|--------------|------------------------|-------------------|----------------|
| ECS          | 160                    | 20                | 33             |

\* Load capacitance (xx=xx pF, S=series resonance) \*\*Package Type Examples (33=ECX-32)

Note: See Product Selection Guide for additional options including tighter tolerances or extended temperature range.

## OPERATING CONDITIONS/ELECTRICAL CHARACTERISTICS

| PARAMETERS                       | CONDITIONS                          | MINIMUM | TYPICAL       | MAXIMUM | UNITS |
|----------------------------------|-------------------------------------|---------|---------------|---------|-------|
| FREQUENCY RANGE                  |                                     | 16.000  |               | 60.000  | MHz   |
| CALIBRATION TOLERANCE            | @ +25°C                             |         |               | ±50*    | PPM   |
| FREQUENCY STABILITY ref @25°C    | -20 ~ +70°C                         |         |               | ±50*    | PPM   |
| SHUNT CAPACITANCE                |                                     |         |               | 5       | pF    |
| LOAD CAPACITANCE                 | C <sub>L</sub> (Customer Specified) | 12      | 16.0 standard | Series  | pF    |
| DRIVE LEVEL                      | DL                                  |         |               | 100     | μW    |
| OPERATING TEMPERATURE            | T <sub>OPR</sub> **                 | -20     |               | +70     | °C    |
| STORAGE TEMPERATURE              | T <sub>STG</sub>                    | -40     |               | +85     | °C    |
| AGING CHARACTERISTICS (Per Year) | @ +25°C ± 3°C per year              |         |               | ±5      | PPM   |

\* Tighter specifications are available. \*\*Extended temperature range available.

## EQUIVALENT SERIES RESISTANCE / MODE OF OSCILLATION

| FREQUENCY RANGE (MHz) | MODE OF OSC | MAX ESR Ω | FREQUENCY RANGE (MHz) | MODE OF OSC | MAX ESR Ω |
|-----------------------|-------------|-----------|-----------------------|-------------|-----------|
| 16.000 ~ 29.999       | Fundamental | 100       | 30.000 ~ 60.000       | Fundamental | 50        |

## PACKAGE DIMENSIONS (mm)

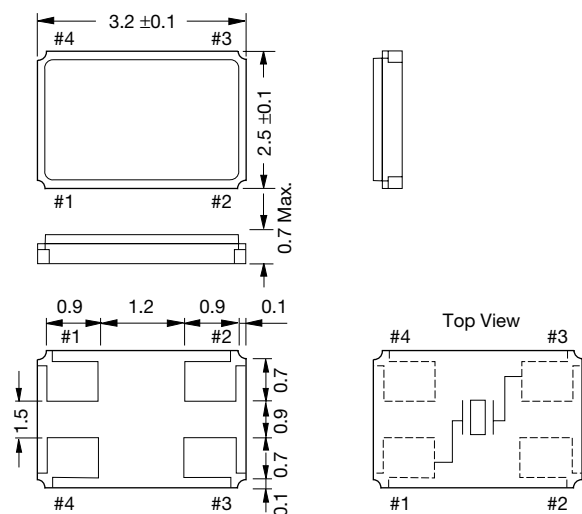


Figure 1) ECX-32 - Top, Side, Bottom and End views

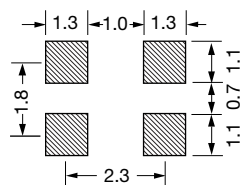


Figure 2) ECX-32 Land Pattern

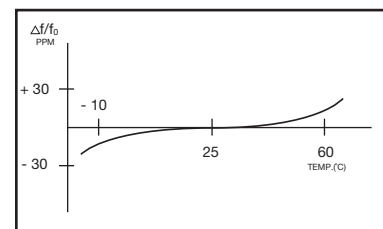


Figure 3) Frequency vs Temperature Curve