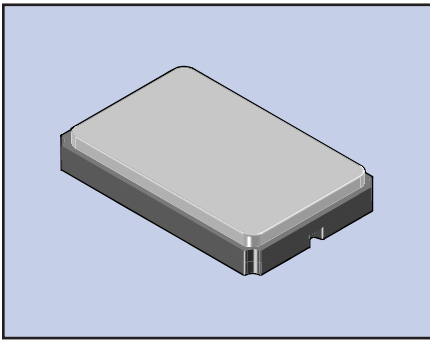




The ECX-64AEN & ECX-64CEN are subminiature SMD crystals with 3.5 X 6 mm footprint. This cost effective all ceramic package is available in 2 and 4 pad versions. The package height measures 1.1 mm max. which is ideal for densely populated PCB applications.

### FEATURES

- Compact and low profile
- Glass sealed ceramic package
- Tape & Reel (1,000 pcs)

### PART NUMBERING GUIDE "EXAMPLE"

| MANUFACTURER | FREQUENCY (16.0000 MHz) | LOAD CAPACITANCE* | PACKAGE TYPE** |
|--------------|-------------------------|-------------------|----------------|
| ECS          | 160                     | 20                | 23AEN          |

\* Load capacitance (xx=xx pF, S=series resonance). \*\*Package Type Examples (23AEN=ECX-64AEN, 23CEN=ECX-64CEN)

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                  |                                     | 12.600  |               | 100.000 | MHz   |
| CALIBRATION TOLERANCE            | @ +25°C                             |         |               | ±30*    | PPM   |
| FREQUENCY STABILITY ref @25°C    | -40 ~ +85°C                         |         |               | ±50*    | PPM   |
| SHUNT CAPACITANCE                |                                     |         |               | 7       | pF    |
| LOAD CAPACITANCE                 | C <sub>L</sub> (Customer Specified) | 10      | 16.0 standard | Series  | pF    |
| DRIVE LEVEL                      | DL                                  |         |               | 100     | μW    |
| OPERATING TEMPERATURE            | T <sub>OPR</sub> **                 | -40     |               | +85     | °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 |
|-----------------------|-------------|-----------|-----------------------|-------------|-----------|
| 12.600 ~ 15.999       | Fundamental | 80        | 20.000 ~ 49.999       | Fundamental | 40        |
| 16.000 ~ 19.999       | Fundamental | 60        | 50.000 ~ 100.000      | 3rd O/T     | 100       |

### PACKAGE DIMENSIONS (mm)

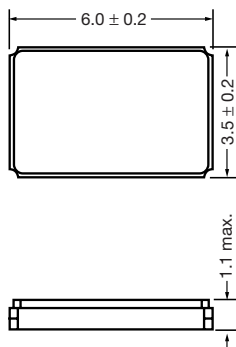


Figure 1) ECX-64AEN & 64CEN - Top and side views

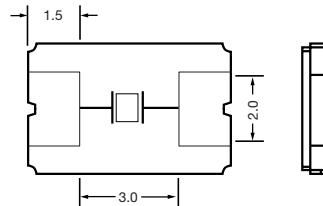


Figure 2) ECX-64AEN - Pad Configuration  
Bottom and End views

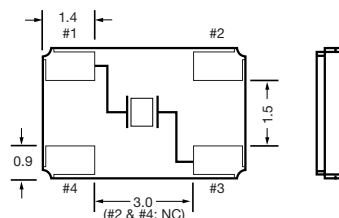


Figure 3) ECX-64CEN - Pad Configuration  
Bottom and End views

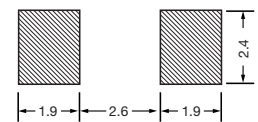


Figure 4) ECX-64AEN - Recommended  
Solder Pad Layout

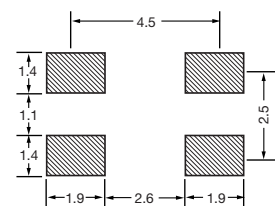


Figure 5) ECX-64CEN - Recommended  
Solder Pad Layout