

These products represent our selection of miniature tubular high frequency crystals. They feature outstanding shock/vibration resistance and environmental characteristics.

FEATURES

- Cost effective
- Excellent aging
- Wide frequency range
- Excellent reliability
- PbFree/RoHS Compliant

PART NUMBERING GUIDE "EXAMPLE"

| MANUFACTURER | FREQUENCY | LOAD CAPACITANCE* | PACKAGE TYPE** |
|--------------|-----------|-------------------|----------------|
| ECS | 35 | 16 | 10X |
| ECS | 160 | 16 | 9X |

* Load capacitance (xx=xx pF, S= series resonance), ** Package Type examples (10X = 3x10, 9X = 3x9)

OPERATING CONDITIONS/ELECTRICAL CHARACTERISTICS

| PARAMETERS | | ECS-3X10X | ECS-3X9X | CONDITIONS |
|------------------------------|----------------|-------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|---------------------------------------------|
| FREQUENCY RANGE | f_0 | 3.5MHz ~ 4MHz | 4MHz ~ 30MHz (fund), 30MHz ~ 70MHz (3rd OT) | |
| FREQUENCY TOLERANCE | $\Delta f/f_0$ | ±50 PPM | | @ +25°C |
| FREQUENCY VS. TEMP. CHARAC. | $\Delta f/f_0$ | ±50 PPM | | -10°C ~ +60°C |
| OPERATING TEMPERATURE RANGE | T_{OPR} | -10 ~ +60 | | °C |
| STORAGE TEMP. RANGE | T_{STG} | -40 ~ +85 | | °C |
| EQUIVALENT SERIES RESISTANCE | R_1 | See table | | |
| LOAD CAPACITANCE | C_L | 16.0 pF typ. (Customer Specified) | | pF |
| SHUNT CAPACITANCE | C_0 | 5.0 max. | | pF |
| DRIVE LEVEL | DL | 50µW ~ 100µW | | µW |
| INSULATION RESISTANCE | IR | 500MΩ min. | | DC 100V ±15V |
| AGING (FIRST YEAR) | $\Delta f/f_0$ | ±5 PPM max. | | 25°C ±3°C |
| SHOCK RESISTANCE | | ±5 PPM Drop test of 3 times on a hard board from 75 cm height or shock test of 3000G x 0.3ms x 1/2 sin wave x 3 directions | | Conditions will vary depending on frequency |

EQUIVALENT SERIES RESISTANCE/ MODE OF OSCILLATION

| FREQUENCY MHz | EQUIVALENT SERIES RESISTANCE | MODE |
|---------------|------------------------------|-------------|
| 3.5MHz ~ 4MHz | 200 Ω MAX. | Fundamental |
| 4MHz ~ 6MHz | 150 Ω MAX. | |
| 6MHz ~ 10MHz | 100 Ω MAX. | |
| 10MHz ~ 30MHz | 50 Ω MAX. | |
| 30MHz ~ 36MHz | 100 Ω MAX. | 3rd O/T |
| 36MHz ~ 70MHz | 80 Ω MAX. | |

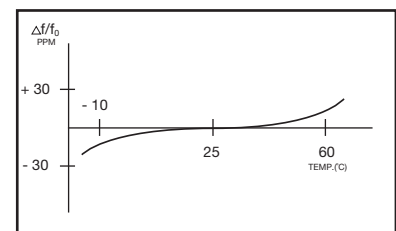


Figure 3) Frequency vs Temperature Curve

PACKAGE DIMENSIONS (mm)

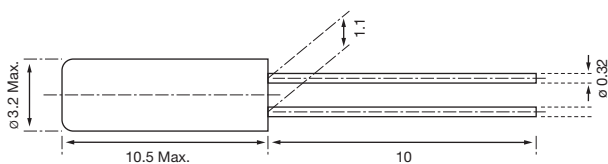


Figure 1) ECS-3x10X

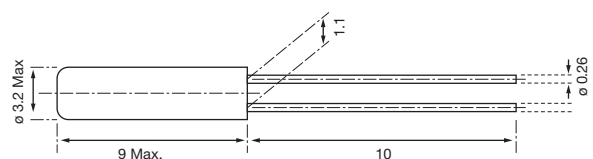


Figure 2) 3x9X