



Chipsmall Limited consists of a professional team with an average of over 10 year of expertise in the distribution of electronic components. Based in Hongkong, we have already established firm and mutual-benefit business relationships with customers from,Europe,America and south Asia,supplying obsolete and hard-to-find components to meet their specific needs.

With the principle of “Quality Parts,Customers Priority,Honest Operation,and Considerate Service”,our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip,ALPS,ROHM,Xilinx,Pulse,ON,Everlight and Freescale. Main products comprise IC,Modules,Potentiometer,IC Socket,Relay,Connector.Our parts cover such applications as commercial,industrial, and automotives areas.

We are looking forward to setting up business relationship with you and hope to provide you with the best service and solution. Let us make a better world for our industry!



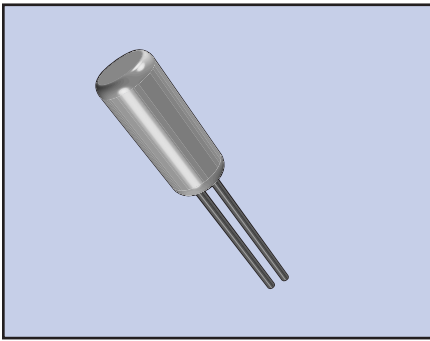
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These products represent our selection of miniature tubular high frequency crystals. They feature outstanding shock/vibration resistance and environmental characteristics.

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. | |

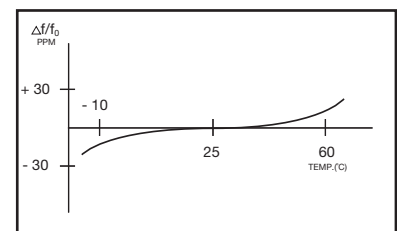


Figure 3) Frequency vs Temperature Curve

PACKAGE DIMENSIONS (mm)

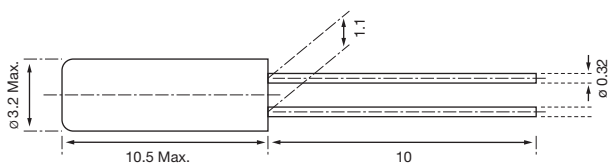


Figure 1) ECS-3x10X

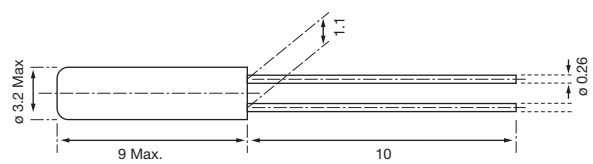


Figure 2) 3x9X