

The ECS-31X Series low frequency tuning fork crystals offer low frequencies in a compact thru hole package.

[Request a Sample](#)

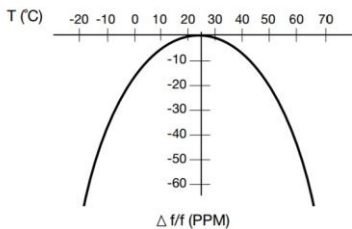
## OPERATING CONDITIONS / ELECTRICAL CHARACTERISTICS



- Miniature size
- Cost effective
- Long term stability
- PbFree/RoHS Compliant

| PARAMETERS                   | CONDITIONS     | ECS-31X |         |        | UNITS               |
|------------------------------|----------------|---------|---------|--------|---------------------|
|                              |                | MIN     | TYP     | MAX    |                     |
| Frequency Range              | Fo             | 30      |         | 150    | KHz                 |
| Frequency Tolerance          | @ +25°C        |         | ±30     |        | ppm                 |
| Temperature Coefficient      |                |         | -0.034  | -0.004 | ppm/°C <sup>2</sup> |
| Shunt Capacitance            | Co             |         | 0.8~1.7 |        | pF                  |
| Load Capacitance             | Specify in P/N |         | 12.5    |        | pF                  |
| Drive Level                  | DL             |         |         | 1.0    | μW                  |
| Equivalent Series Resistance | R1             |         |         | 50K    | Ω                   |
| Insulation Resistance        | 100V DC ±15V   | 500M    |         |        | Ω                   |
| Turnover Temperature         |                |         | +25     |        | °C                  |
| Operating Temperature        | Topr           | -10     |         | +60    | °C                  |
| Storage Temperature          | Tstg           | -40     |         | +85    | °C                  |
| Aging (First Year)           | @ +25°C ±3°C   |         |         | ±5     | ppm                 |
| Motional Capacitance         |                |         | 1 ~ 4   |        | fF                  |
| Capacitance Ratio            |                |         | 425~800 |        |                     |

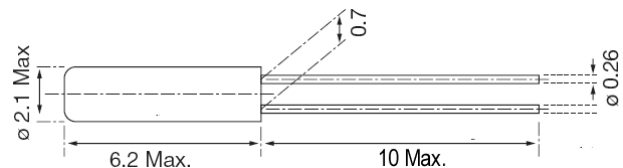
### PARABOLIC TEMPERATURE CURVE



To determine frequency stability, use parabolic curvature.  
For example: What is the stability at 45°C?

- 1) Change in T (°C) = 45 - 25 = 20°C
- 2) Change in frequency =  $-0.04 \text{ PPM} \times (\Delta T)^2$   
=  $-0.04 \text{ PPM} \times (20)^2$   
= -16.0 PPM

## DIMENSIONS (mm)



## PART NUMBERING GUIDE: Example ECS-.400-12.5-13X

| ECS - FREQUENCY ABBREVIATION | LOAD CAPACITANCE | PACKAGE |
|------------------------------|------------------|---------|
|------------------------------|------------------|---------|

ECS

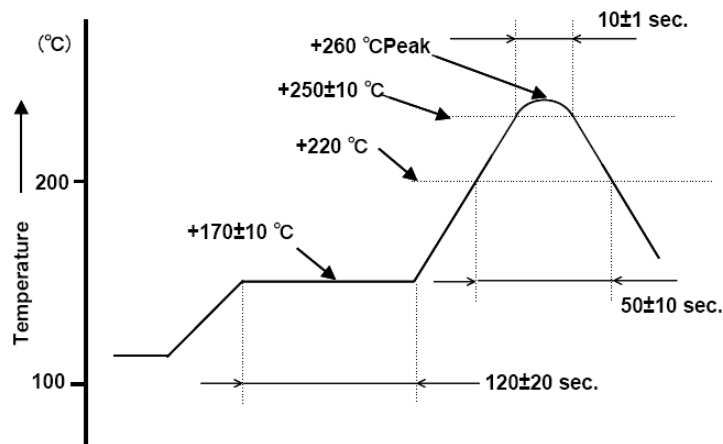
.400 = 40.000 KHz

12.5 = 12.5 pF

13X = 2x6

Rev.2017

| SOLDER PROFILE                          |
|-----------------------------------------|
| Peak solder Temp +260°C Max 10 sec Max. |
| 2 Cycles Max.                           |
| MSL 1, Lead Finish Sn/Cu Matte          |



*Figure 1) Suggested Solder Profile*