

The ECX-3TAX is a 2.0 mm low profile ruggedized thermoplastic molded 32.768KHz SMD tuning fork crystal. This crystal is excellent for SMD applications with limited circuit board space requirements.

## FEATURES

- Low profile 2.0 mm maximum height
- Industry standard footprint
- Long term stability
- Excellent shock resistance
- Excellent environmental characteristics
- Tape & Reel (3,000 pcs)
- PbFree/RoHS Compliant

# Discontinued

## PART NUMBERING GUIDE "EXAMPLE"

MANUFACTURER	FREQUENCY	LOAD CAPACITANCE	PACKAGE TYPE
ECS	- .327	- 12.5	- 24X

## OPERATING CONDITIONS/ELECTRICAL CHARACTERISTICS

PARAMETERS	ECX-3TA	UNITS
NOMINAL FREQUENCY	F <sub>0</sub>	32.768 KHz
LOAD CAPACITANCE	C <sub>L</sub>	12.5 Standard (6.0 Optional)
DRIVE LEVEL	D <sub>L</sub>	1.0 max.
CALIBRATION TOLERANCE	@ +25°C	±20 PPM
EQUIVALENT SERIES RESISTANCE	R <sub>1</sub>	50 max. K Ω
TEMPERATURE COEFFICIENT		-0.040 PPM/°C <sup>2</sup> max.
OPERATING TEMPERATURE RANGE	T <sub>OPR</sub>	-10 ~ +60 °C
MAX. OPERATING TEMPERATURE RANGE		-40 ~ +85 °C
Q FACTOR	Q	50,000 min.
TURNOVER TEMPERATURE	T <sub>O</sub>	+25 ± 5 °C
STORAGE TEMPERATURE RANGE	T <sub>STG</sub>	-55 ~ +125 °C
INSULATION RESISTANCE	IR	500MΩ min./ DC 100V
SHUNT CAPACITANCE	C <sub>0</sub>	2.0 typical pF
MOTIONAL CAPACITANCE	C <sub>1</sub>	0.003 pF typical
AGING (FIRST YEAR)	Δf/f <sub>0</sub>	±3 PPM max. @ +25°C

## PACKAGE DIMENSIONS (mm)

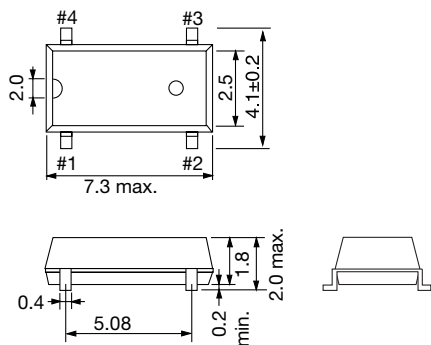


Figure 1) ECX-3TA – Top, Side and End views

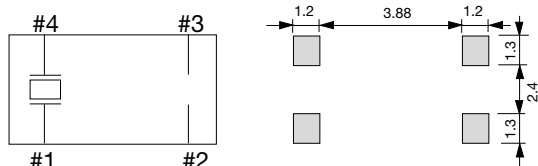
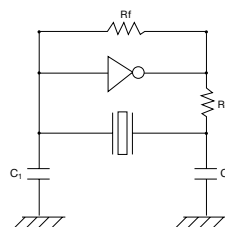


Figure 2) ECX-3TA – Land Pattern - Top view

## RECOMMENDED OSCILLATION CIRCUIT

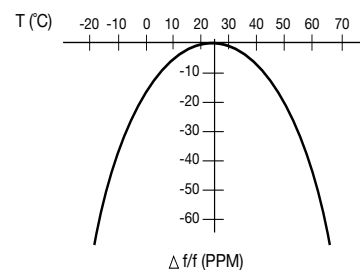


## ELECTRICAL CHARACTERISTICS

IC: TC 4069P  
 Rf: 10MΩ  
 Rd: 330KΩ (As required)  
 C<sub>1</sub> = 22pF, C<sub>2</sub> = 22pF  
 V<sub>DD</sub> = 3.0V

*In this circuit, low drive level with a maximum of 1μW is recommended. If excessive drive is applied, irregular oscillation or quartz element fractures may occur.*

## 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 PPM × (ΔT)<sup>2</sup>  
 = -0.04 PPM × (20)<sup>2</sup>  
 = -16.0 PPM