# ECX-3TAX MICRO MINIATURE SMD TUNING FORK CRYSTAL



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)
- RoHS Compliant w/exemption for Pb in High Temp Solder

## 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	Fo	32.768	KHz
LOAD CAPACITANCE	CL	12.5 Standard (6.0 Optional)	pF
DRIVE LEVEL	DL	1.0 max.	μW
CALIBRATION TOLERANCE	@ +25°C	±20	PPM
EQUIVALENT SERIES RESISTANCE	R <sub>1</sub>	50 max.	KΩ
TEMPERATURE COEFFICIENT		-0.040 PPM/°C <sup>2</sup> max.	PPM/(ΔC°)
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	To	+25 ± 5	°C
STORAGE TEMPERATURE RANGE	T <sub>STG</sub>	-55 ~ +125	°C
INSULATION RESISTANCE	IR	500M $\Omega$ min./ DC 100V	MΩ
SHUNT CAPACITANCE	Co	2.0 typical	pF
MOTIONAL CAPACITANCE	C <sub>1</sub>	0.003 pF typical	pF
AGING (FIRST YEAR)	∆f/fo	±3 PPM max. @ +25°C	PPM

## PACKAGE DIMENSIONS (mm)



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

## RECOMMENDED OSCILLATION CIRCUIT

ELECTRICAL CHARACTERISTICS IC: TC 4069P

Rf: 10MΩ

Rd: 330KΩ (As required)

 $C_1 = 22pF, C_2 = 22pF$ 

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





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 x ( $\Delta$ T) <sup>2</sup> = -0.04 PPM x (20) <sup>2</sup> = -16 0 PPM

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fractures may occur.

