

Housing for the ECX-306/306I crystal is made from the same thermoplastic that is industry standard for integrated circuits. This ruggedized molded package is excellent for SMD applications.

## **FEATURES**

- Low profile
- · Long term stability
- · Industry standard footprint
- Excellent shock resistance
- Excellent environmental characteristics
- Tape and Reel (3,000 pcs)

# PART NUMBERING GUIDE "EXAMPLE"

	FREQUENCY	LOAD CAPACITANCE	PACKAGE TYPE**
ECS -	327 -	- 12.5 –	17

<sup>\*\*</sup> Package Type examples (-17= ECX-306, 17I= ECX-306I)

## OPERATING CONDITIONS/ELECTRICAL CHARACTERISTICS

PARAMETERS		ECX-306/306I	UNITS
NOMINAL FREQUENCY	Fo	32.768	KHz
LOAD CAPACITANCE	$C_L$	12.5 Standard (6.0 Optional)	pF
DRIVE LEVEL	$D_L$	1 max.	μW
CALIBRATION TOLERANCE	@ 25°C	±20	PPM
EQUIVALENT SERIES RESISTANCE	R <sub>1</sub>	50 max.	ΚΩ
TEMPERATURE COEFFICIENT		-0.040 PPM/°C² max.	PPM/(∆C°)
OPERATING TEMPERATURE RANGE	Topr	-10 ~ +60	°C
MAX. OPERATING TEMPERATURE RANGE		-40 ~ +85	°C
Q FACTOR	Q	50,000 min.	
TURNOVER TEMPERATURE	T <sub>0</sub>	+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	1.35 typical	pF
MOTIONAL CAPACITANCE	$C_1$	0.003 pF typical	pF
AGING (FIRST YEAR)	∆f/fo	±3 PPM max. @ +25°C	PPM

# PACKAGE DIMENSIONS (mm)

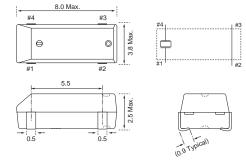


Figure 1) ECX-306 - Top, Side and End views with pin connections

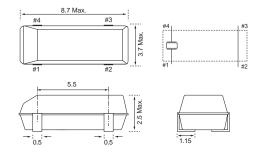


Figure 2) ECX-3061 - Top, Side and End views with pin connections

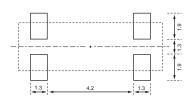
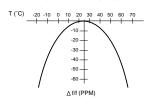


Figure 3) ECX-306/3061 Land Pattern - Top view

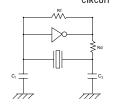
### PARABOLIC TEMPERATURE CURVE



to undertinine inequency standing, 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  $\times$  ( $\Delta$ T) = -0.04 PPM x (20)

= -16.0 PPM

#### RECOMMENDED OSCILLATION CIRCUIT



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

## ELECTRICAL CHARACTERISTICS

IC: TC 4069P, Rf:  $10M\Omega$ Rd: 330K $\Omega$  (As required)  $C_1 = 22pF, C_2 = 22pF, V_{DD} = 3.0V$ 

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