



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!



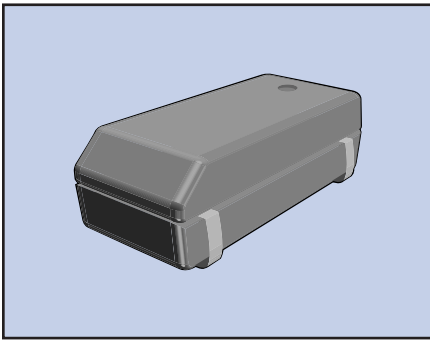
## Contact us

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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"

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

\*\* Package Type examples (-17= ECX-306, 17I= ECX-306I)

### OPERATING CONDITIONS/ELECTRICAL CHARACTERISTICS

PARAMETERS		ECX-306/306I	UNITS
NOMINAL FREQUENCY	F <sub>0</sub>	32.768	KHz
LOAD CAPACITANCE	C <sub>L</sub>	12.5 Standard (6.0 Optional)	pF
DRIVE LEVEL	D <sub>L</sub>	1 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	T <sub>O</sub>	+25 ± 5	°C
STORAGE TEMPERATURE RANGE	T <sub>STG</sub>	-55 ~ +125	°C
INSULATION RESISTANCE	IR	500MΩ min./ DC 100V	MΩ
SHUNT CAPACITANCE	C <sub>0</sub>	1.35 typical	pF
MOTIONAL CAPACITANCE	C <sub>1</sub>	0.003 pF typical	pF
AGING (FIRST YEAR)	Δf/f <sub>0</sub>	±3 PPM max. @ +25°C	PPM

### PACKAGE DIMENSIONS (mm)

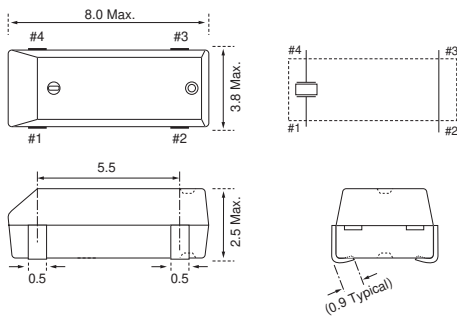


Figure 1) ECX-306 - Top, Side and End views with pin connections

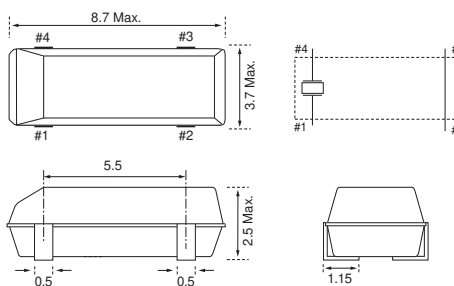


Figure 2) ECX-306I - Top, Side and End views with pin connections

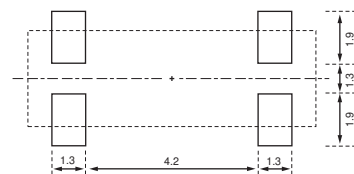
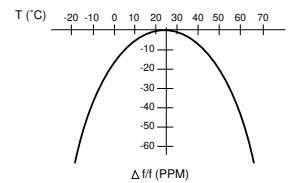


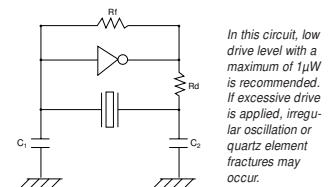
Figure 3) ECX-306/306I Land Pattern - Top view

### PARABOLIC TEMPERATURE CURVE



To determine frequency stability, use parabolic curve. 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 (ΔT)<sup>2</sup>  
 = -0.04 PPM x (20)<sup>2</sup>  
 = -16.0 PPM

### RECOMMENDED OSCILLATION CIRCUIT



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.

### 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