



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!



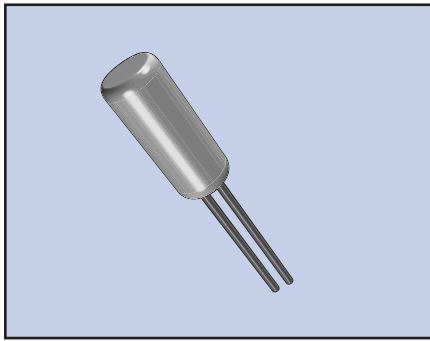
Contact us

Tel: +86-755-8981 8866 Fax: +86-755-8427 6832

Email & Skype: info@chipsmall.com Web: www.chipsmall.com

Address: A1208, Overseas Decoration Building, #122 Zhenhua RD., Futian, Shenzhen, China





The ECS-31 Series features the same characteristics as only tuning fork crystals offer. Because of their miniature size they are ideal for portable and communication equipment applications.

FEATURES

- Miniature size
- Cost effective
- Long term stability
- Excellent shock and vibration characteristics

PART NUMBERING GUIDE "EXAMPLE"

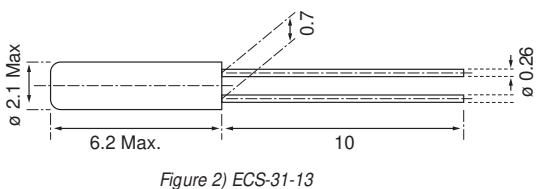
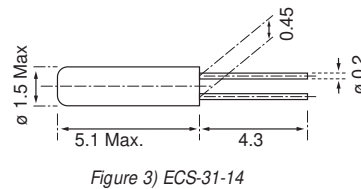
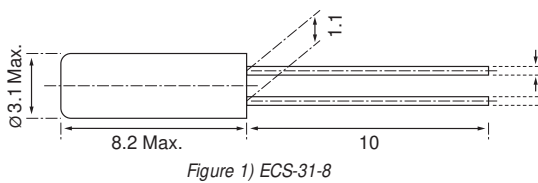
MANUFACTURER	FREQUENCY	LOAD CAPACITANCE	PACKAGE TYPE*
ECS	.400	12.5	8
ECS	.400	12.5	13
ECS	2.0	12.5	14

* Package type examples (8=3x8, 13=2x6, 14=1x5)

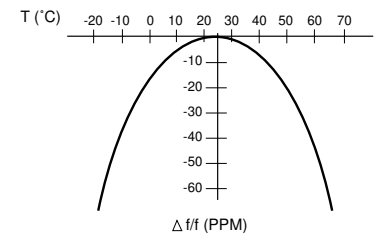
OPERATING CONDITIONS/ELECTRICAL CHARACTERISTICS

PARAMETERS		3X8	2X6	1X5	CONDITIONS
FREQUENCY RANGE	f_0	20KHz ~ 40KHz	30KHz ~ 150KHz	200KHz	KHz
FREQUENCY TOLERANCE	$\Delta f/f_0$	± 30 PPM	± 30 PPM	$\pm 10,000$ PPM	@ +25°C
FREQUENCY VS. TEMP. CHARAC.	$\Delta f/f_0$	See Drawing			-10°C ~ +60°C
TURNOVER TEMPERATURE	T_m	+25°C typ.			
TEMPERATURE COEFFICIENT	β	-0.034 PPM/°C ² typ.			Varies depending on frequency
OPERATING TEMP. RANGE	T_{OPR}	-10 ~ +60			°C
STORAGE TEMP. RANGE	T_{STG}	-40 ~ +85			°C
EQUIVALENT SERIES RESISTANCE	R_1	30 ~ 50 (max.)		10 (max.)	KΩ
LOAD CAPACITANCE	C_L	12.5pF typ. (Customer Specified)			pF
MOTIONAL CAPACITANCE	C_1	1 ~ 4fF typ.			fF
SHUNT CAPACITANCE	C_0	0.8 ~ 1.7pF typ.			pF
CAPACITANCE RATIO	τ	425 ~ 800 typ.			
DRIVE LEVEL	DL	1μW max.			μW
INSULATION RESISTANCE	IR	500 MΩ min.			DC 100V±15
AGING (FIRST YEAR)	$\Delta f/f_0$	±5 PPM max.			+25°C ± 3°C
SHOCK RESISTANCE		±5 PPM max. Drop test of 3 times on a hard board from 75 cm height or shock test of 3000G x 0.3ms x 1/2 sin wave x 3 directions			Conditions will vary depending on frequency

PACKAGE DIMENSIONS (mm)



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 = $-0.04 \text{ PPM} \times (\Delta T)^2$
 $= -0.04 \text{ PPM} \times (20)^2$
 $= -16.0 \text{ PPM}$