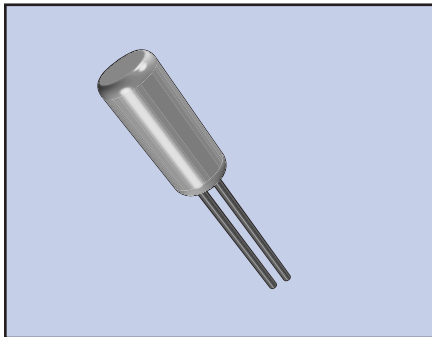




These products represent our selection of miniature tubular high frequency crystals. They feature outstanding shock/vibration resistance and environmental characteristics.

FEATURES

- Cost effective
- Excellent aging
- Wide frequency range
- Excellent reliability
- PbFree/RoHS Compliant



PART NUMBERING GUIDE "EXAMPLE"

MANUFACTURER		FREQUENCY		LOAD CAPACITANCE*		PACKAGE TYPE**
ECS	-	35	-	16	-	10X
ECS	-	160	-	16	-	9X

* Load capacitance (xx=xx pF, S= series resonance), ** Package Type examples (10X = 3x10, 9X = 3x9)

OPERATING CONDITIONS/ELECTRICAL CHARACTERISTICS

PARAMETERS		ECS-3X10X	ECS-3X9X	CONDITIONS
FREQUENCY RANGE	f_0	3.5MHz ~ 4MHz	4MHz ~ 30MHz (fund), 30MHz ~ 70MHz (3rd OT)	
FREQUENCY TOLERANCE	$\Delta f/f_0$	± 50 PPM		@ +25°C
FREQUENCY VS. TEMP. CHARAC.	$\Delta f/f_0$	± 50 PPM		-10°C ~ +60°C
OPERATING TEMPERATURE RANGE	T_{OPR}	-10 ~ +60		°C
STORAGE TEMP. RANGE	T_{STG}	-40 ~ +85		°C
EQUIVALENT SERIES RESISTANCE	R_1	See table		
LOAD CAPACITANCE	C_L	16.0 pF typ. (Customer Specified)		pF
SHUNT CAPACITANCE	C_0	5.0 max.		pF
DRIVE LEVEL	D_L	50μW ~ 100μW		μW
INSULATION RESISTANCE	IR	500MΩ min.		DC 100V ±15V
AGING (FIRST YEAR)	$\Delta f/f_0$	± 5 PPM max.		25°C ±3°C
SHOCK RESISTANCE		± 5 PPM 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

EQUIVALENT SERIES RESISTANCE/ MODE OF OSCILLATION

FREQUENCY MHZ	EQUIVALENT SERIES RESISTANCE	MODE
3.5MHZ ~ 4MHZ	200 Ω MAX.	Fundamental
4MHZ ~ 6MHZ	150 Ω MAX.	
6MHZ ~ 10MHZ	100 Ω MAX.	
10MHZ ~ 30MHZ	50 Ω MAX.	
30MHZ ~ 36MHZ	100 Ω MAX.	3rd O/T
36MHZ ~ 70MHZ	80 Ω MAX.	

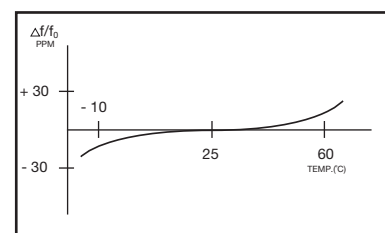


Figure 3) Frequency vs Temperature Curve

PACKAGE DIMENSIONS (mm)

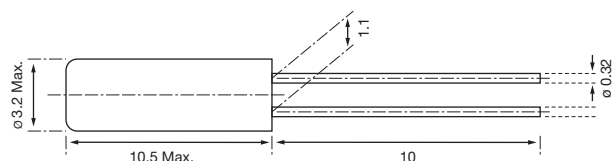


Figure 1) ECS-3x10X

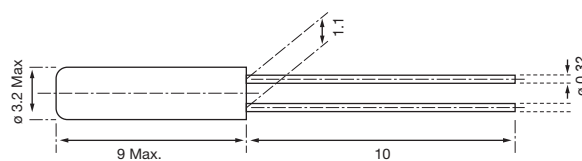


Figure 2) 3x9X