

- ▶ Cost effective
- ▶ Low profile
- ▶ Industry Standard Footprint
- ▶ Pb Free/RoHS Compliant
- ▶ MSL 1

# CSM-4AX

## SMD Quartz Crystal

The CSM-4AX is an excellent choice for a low cost SMD crystal. The CSM-4AX (28AX) has a case height of 5.0 mm Max. in a resistance weld metal package. Lower profile package height of 4.0 mm Max. is available with the (28ALX) package.

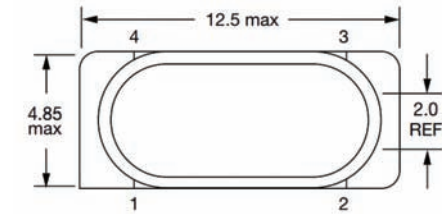
### OPERATING CONDITIONS / ELECTRICAL CHARACTERISTICS

PARAMETERS	CONDITIONS	CSM-4AX			UNITS
		MIN	TYP	MAX	
Frequency Range	f <sub>o</sub>	3.57		70.00	MHz
Frequency Tolerance	at +25°C			± 30	ppm
Frequency Stability	Standard -10 to +70°C			± 50	ppm
Shunt Capacitance	C <sub>o</sub>			7	pF
Load Capacitance (CL)	Specify in P/N	10	20	Series	pF
Drive Level				500	μW
Operating Temperature		-10		+70	°C
Storage Temperature		-55		+125	°C
Aging (Per Year)	@ +25°C ±3°C			±5	ppm

### EQUIVALENT SERIES RESISTANCE/MODE OF OSCILLATION

FREQUENCY RANGE (MHz)	MODE OF OSC	MAX ESR Ω	FREQUENCY RANGE (MHz)	MODE OF OSC	MAX ESR Ω
3.57 ~ 4.999	Fundamental	200	9.000 ~ 12.999	Fundamental	60
5.000 ~ 5.999	Fundamental	150	13.000 ~ 19.999	Fundamental	40
6.000 ~ 6.999	Fundamental	100	20.000 ~ 30.000	Fundamental	30
7.000 ~ 8.999	Fundamental	80	27.000 ~ 80.000	3rd Overtone	100

### PACKAGE DIMENSIONS (mm)



Height "H" MAX	
-28AX	-5.0 mm
-28ALX	-4.0 mm

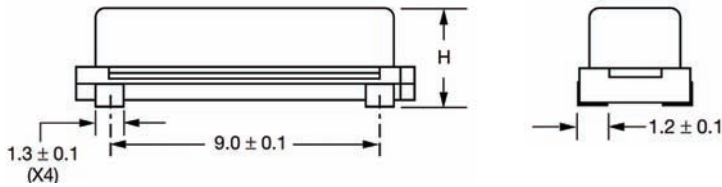


Figure 1) Top, Side, Bottom and End views

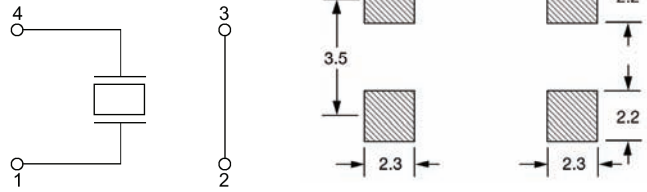


Figure 2) Crystal Connections

Figure 3) Land Pattern

### PART NUMBERING GUIDE: Example ECS-200-20-28AX-TR

ECS - Frequency Abbreviation - Load Capacitance - Package

200 = 20.000 MHz  
See P/N Guide

20 = 20 pF  
S=Series

28AX = 5.0 mm  
28ALX = 4.0 mm

Custom Options			
Tolerance	*Stability	Temperature	Packaging
A= ± 25 ppm J= ± 20 ppm R= ± 15 ppm C= ± 10 ppm	D= ± 100 ppm E= ± 50 ppm G= ± 30 ppm H= ± 25 ppm	M= -20 ~ +70°C N= -40 ~ +85°C P= -40 ~ +105°C S= -40 ~ +125°C	TR= Tape & Reel 1K/Reel