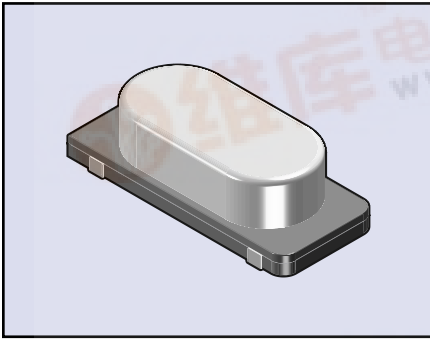




The CSM-4A SMD version of the HC-49US leaded crystal. The CSM-4A has a case height of 5 mm maximum in a resistance-weld metal package. The CSM-4A is also pin out compatible with the EPSON MA-506.

FEATURES

- Cost effective
- Resistance-weld sealing
- Extended Temp range available
- Tape & Reel (1,000 pcs)

PART NUMBERING GUIDE "EXAMPLE"

MANUFACTURER	FREQUENCY (4.000 MHz)	LOAD CAPACITANCE*	PACKAGE TYPE
ECS	40	20	28A

* Load capacitance (xx=xx pF, S=series resonance) Package Type examples (-28A = 5.0 mm max. height, -28AL = 4.0 mm max. height)

Note: See Product Selection Guide for additional options including tighter tolerances or extended temperature range.

OPERATING CONDITIONS/ELECTRICAL CHARACTERISTICS

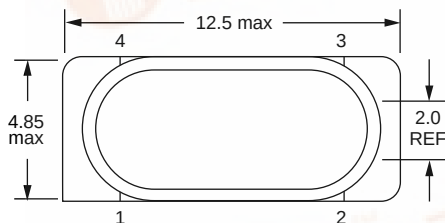
PARAMETERS	CONDITIONS	MINIMUM	TYPICAL	MAXIMUM	UNITS
FREQUENCY RANGE		3.579545		70.000	MHz
CALIBRATION TOLERANCE	@ +25°C			±30*	PPM
FREQUENCY STABILITY ref @25°C	-10 ~ +70°C			±50*	PPM
SHUNT CAPACITANCE				7	pF
LOAD CAPACITANCE	C _L (Customer Specified)	10	20.0 standard	Series	pF
DRIVE LEVEL	DL			500	μW
OPERATING TEMPERATURE	T _{OPR} **	-10		+70	°C
STORAGE TEMPERATURE	T _{STG}	-30		+85	°C
AGING CHARACTERISTICS (Per Year)	@ +25°C ± 3°C per year			±5	PPM

* Tighter specifications are available. **Extended temperature range available.

EQUIVALENT SERIES RESISTANCE / MODE OF OSCILLATION

FREQUENCY RANGE (MHz)	MODE OF OSC	MAX ESR Ω	FREQUENCY RANGE (MHz)	MODE OF OSC	MAX ESR Ω
3.579545 ~ 4.999	Fundamental	200	9.000 ~ 12.000	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 O/T	100

PACKAGE DIMENSIONS (mm)



Height "H" (max.)	
-28A	5.0 mm
-28AL	4.0 mm

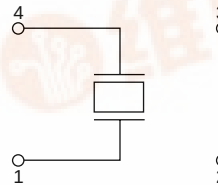


Figure 2) CSM-4A Internal Connections

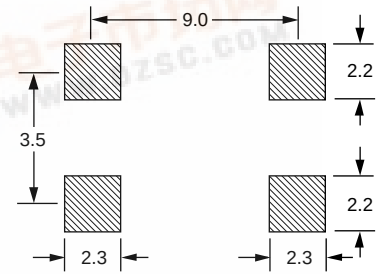


Figure 3) Land Pattern

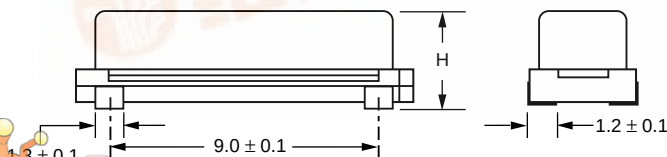


Figure 1) CSM-4A - Top, Side and End views