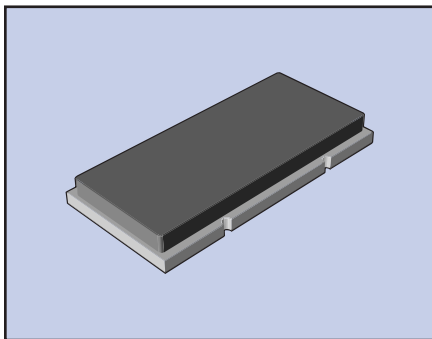




The CSM-12 is enclosed in a ceramic package. It is an excellent choice for a low profile crystal with a height of 2.5 mm.

FEATURES

- Cost effective
- Space saving design
- RoHS Compliant (Note 7 Exemption)
- Tape & Reel (1,000 pcs)

PART NUMBERING GUIDE "EXAMPLE"

	FREQUENCY (16.0000MHz)	LOAD CAPACITANCE*	PACKAGE TYPE
ECS	- 160 -	20	- 18

* Load capacitance (xx=xx pF, S= series resonance)

Note: See Product Selection Guide for additional options.

OPERATING CONDITIONS/ELECTRICAL CHARACTERISTICS

PARAMETERS	CONDITIONS	MINIMUM	TYPICAL	MAXIMUM	UNITS
FREQUENCY RANGE	f_0	3.57		30.00	MHz
MODE OF OSCILLATION	Fundamental				
LOAD CAPACITANCE	C_L	10.0	20.0 standard	Series	pF
DRIVE LEVEL	D_L			100	μ W
FREQUENCY TOLERANCE	@ +25°C	-30		+30	PPM
EQUIVALENT SERIES RESISTANCE	R_1		See ESR CHART		Ohms
FREQUENCY STABILITY	$\Delta f/f_0$	-50		+50	PPM
OPERATING TEMP. RANGE	T_{OPR}	-10		+70	°C
STORAGE TEMP. RANGE	T_{STG}	-40		+85	°C
SHUNT CAPACITANCE	C_0			7.0	pF
AGING (FIRST YEAR @ +25°C)	$\Delta f/f_0$	-5.0		+5.0	PPM

PACKAGE DIMENSIONS (mm)

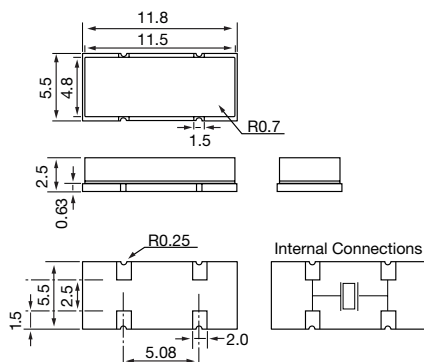


Figure 1) CSM-12 - Top, Side and Bottom views

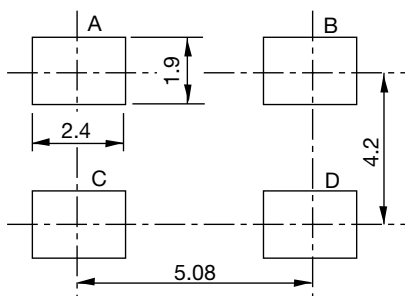


Figure 2) CSM-12 Land Pattern - Bottom view

EQUIVALENT SERIES RESISTANCE CURVE	
FREQUENCY MHz	(Ω MAX.)
3.57 ~ 3.999	200
4.00 ~ 5.999	150
6.00 ~ 9.999	100
10.00 ~ 13.999	80
14.00 ~ 30.00	50

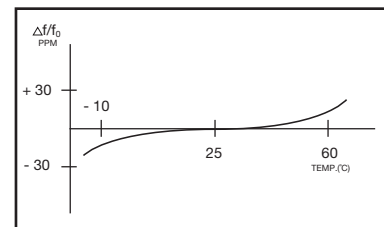


Figure 3) Frequency vs Temperature Curve