



kHz RANGE CRYSTAL UNIT



Product Number
MC-146 : Q1xMC1462xxxx0X

MC-146 / MC-146 TYPE

- Frequency range : MC-146---32.768 kHz
: MC-146 TYPE---32 kHz to 100 kHz
- External dimension : $7.0 \times 1.5 \times 1.4$ mm
- Overtone order : Fundamental
- Applications : Small communications devices



Specifications (characteristics)

Item	Symbol	Specifications		Conditions / Remarks
		MC-146	MC-146 TYPE	
Nominal frequency range	f _{nom}	32.768 kHz	32 kHz to 100 kHz	Please contact us about available frequencies.
Storage temperature	T _{stg}	-55 °C to +125 °C		Storage as single product.
Operating temperature	T _{use}	-40 °C to +85 °C		
Level of drive	DL	1.0 μW Max.		Operating Drive level 0.5 μW Max.
Frequency tolerance (standard)	f _{tol}	$\pm 20 \times 10^{-6}$, $\pm 50 \times 10^{-6}$	$\pm 50 \times 10^{-6}$, $\pm 100 \times 10^{-6}$	+25 °C, DL=0.1 μW
Turnover temperature	Ti	+25 °C $\pm$ 5 °C		
Parabolic coefficient	B	$-0.04 \times 10^{-6} / ^\circ\text{C}^2$ Max.		
Load capacitance	CL	7 pF, 9 pF, 12.5 pF		Please specify
Motional resistance (ESR)	R1	65 kΩ Max.	65 kΩ to 25 kΩ	
Motional capacitance	C1	1.9 fF Typ.	2.5 fF to 0.6 fF	
Shunt capacitance	C0	0.8 pF Typ.	1.2 pF to 0.5 pF	
Frequency aging	f _{age}	$\pm 3 \times 10^{-6} / \text{year}$ Max.	$\pm 5 \times 10^{-6} / \text{year}$ Max.	+25 °C, First year

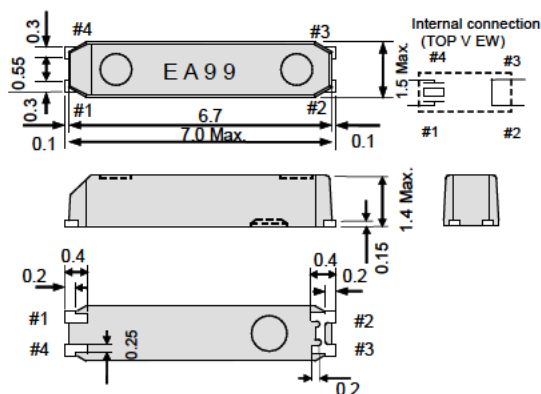
Product name MC-146 32.768000kHz 12.5 +20.0-20.0

(Standard form)

① Model ② Frequency ③ Load capacitance(pF) ④ Frequency tolerance($\times 10^{-6}$, +25 °C)

External dimensions

(Unit:mm)



Do not connect #2 and #3 to external device.

The metal case inside of the molding compound may be exposed on the top or bottom of this product.
This purely cosmetic and does not have any effect on quality, reliability or electrical specs.

Footprint (Recommended)

(Unit:mm)

