



kHz RANGE CRYSTAL UNIT



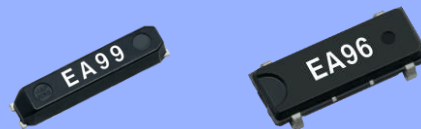
Product Number (please contact us)

MC-146 : Q1xMC1462xxxx00

MC-156 : Q1xMC1562xxxx00

MC-146 / MC-156

- Frequency range : 32.768 kHz (32 kHz to 100 kHz)
- External dimension : 7.0 × 1.5 × 1.4 mm ...MC-146
7.1 × 3.3 × 1.5 mm ...MC-156
- Overtone order : Fundamental
- Applications : Small communications devices



Actual size

MC-146

MC-156

Specifications (characteristics)

Item	Symbol	Specifications		Conditions / Remarks
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)

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②

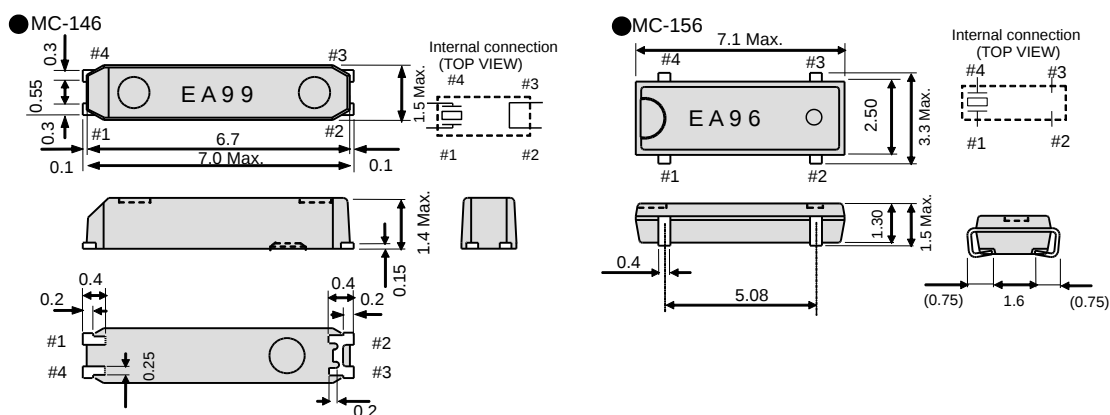
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④

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

External dimensions

(Unit:mm)

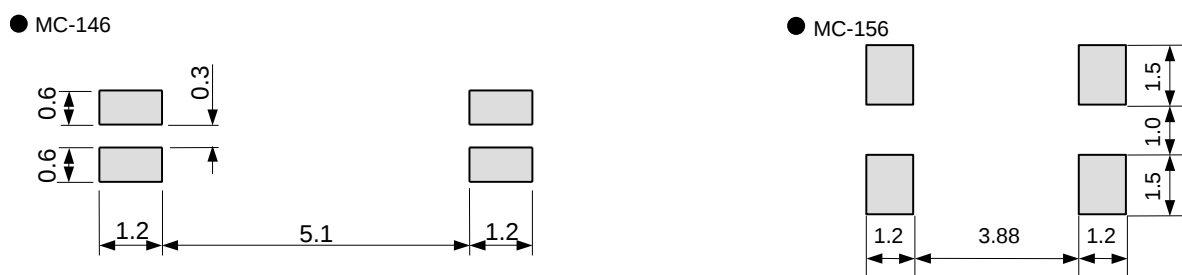


Do not connect #2 and #3 to external device.

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)



Mouser Electronics

Authorized Distributor

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Epson:

[MC-146 32.7680KA-A0:ROHS](#) [MC-146 32.7680KA-A3: PURE SN](#) [MC-146 32.7680KA-A3:ROHS](#) [MC-146 32.7680KA-AC0:ROHS](#) [MC-146 32.7680KA-AC3:ROHS](#) [MC-146 32.7680KA-AG:ROHS](#) [MC-146 32.7680KA-AG0: PURE SN](#) [MC-146 32.7680KA-AC5:RoHS](#) [MC-146 32.7680KA-A0 ROHS](#) [MC-146 32.768KA-AC3:ROHS](#)