kHz RANGE CRYSTAL UNIT

MC-146

Product Number
MC-146: Q13MC1462xxxx0X

- Frequency range : 32.768 kHz
- External dimension : 7.0 × 1.5 × 1.4 mm
- Overtone order : Fundamental
- Applications : Small communications devices



Specifications (characteristics)

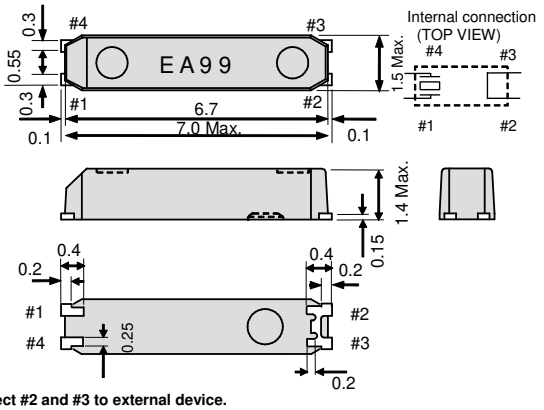
Item	Symbol	Specifications	Conditions / Remarks
Nominal frequency range	f_nom	32.768 kHz	
Storage temperature	T_stg	-55 °C to +125 °C	Storage as single product.
Operating temperature	T_use	-40 °C to +85 °C	
Level of drive	DL	1.0 μW Max.	Operating Drive level 0.5 μW Max.
Frequency tolerance (standard)	f_tol	$\pm 20 \times 10^{-6}$, $\pm 50 \times 10^{-6}$, $\pm 100 \times 10^{-6}$	+25 °C, DL=0.1 μW
Turnover temperature	Ti	+25 °C ± 5 °C	
Parabolic coefficient	B	-0.04×10^{-6} / °C² Max.	
Load capacitance	CL	7 pF, 9 pF, 12.5 pF	Please specify
Motional resistance (ESR)	R1	65 kΩ Max.	
Motional capacitance	C1	1.9 fF Typ.	
Shunt capacitance	C0	0.8 pF Typ.	
Frequency aging	f_age	$\pm 3 \times 10^{-6}$ / year Max.	+25 °C, First year

Product name (Standard form): MC-146 ① 32.768000kHz ② 12.5 ③ +20.0-20.0 ④

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

External dimensions

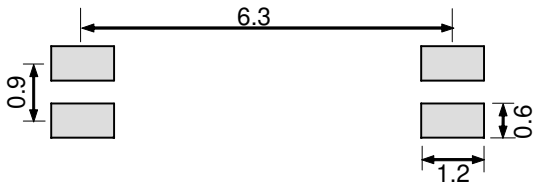
(Unit:mm)



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)



►Explanation of the mark that are using it for the catalog

	►Pb free.
	►Complies with EU RoHS directive. *About the products without the Pb-free mark. Contains Pb in products exempted by EU RoHS directive. (Contains Pb in sealing glass, high melting temperature type solder or other.)
	►Designed for automotive general equipment.
	►Designed for automotive applications related to driving and safety.

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