



Product Number (please contact us)

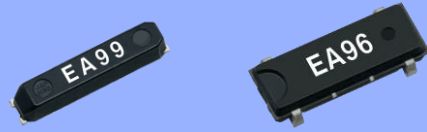
MC-146 : Q1xMC146xxxx00

MC-156 : Q1xMC156xxxx00

**kHz RANGE CRYSTAL UNIT**  
**LOW PROFILE SMD**

**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

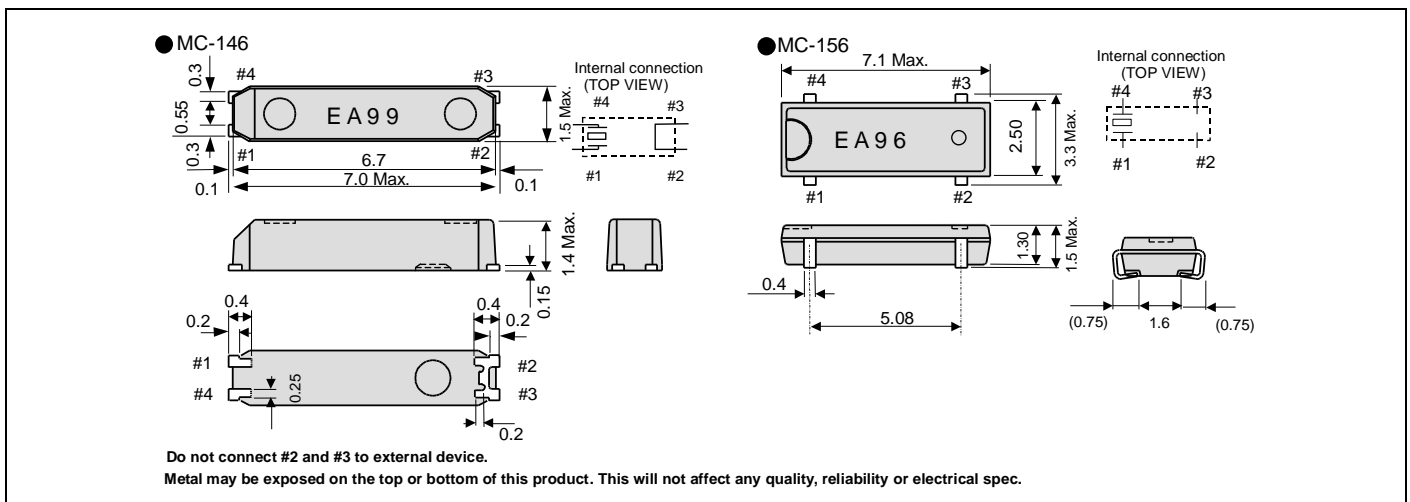
MC-156

**Specifications (characteristics)**

Item	Symbol	Specifications		Conditions / Remarks
Nominal frequency range	f <sub>nom</sub>	32.768 kHz	32 kHz to 100 kHz	Please contact us for inquiries regarding available frequencies
Storage temperature	T <sub>stg</sub>	-55 °C to +125 °C		Store as bare product.
Operating temperature	T <sub>use</sub>	-40 °C to +85 °C		
Level of drive	DL	1.0 μW Max.		Operating Drive level 0.5 μW Max.
Frequency tolerance (standard)	f <sub>tol</sub>	± 20 × 10 <sup>-6</sup> , ± 50 × 10 <sup>-6</sup>	± 50 × 10 <sup>-6</sup> , ± 100 × 10 <sup>-6</sup>	+25 °C, DL=0.1 μW
Turnover temperature	T <sub>i</sub>	+25 °C ± 5 °C		
Parabolic coefficient	B	-0.04 × 10 <sup>-6</sup> / °C <sup>2</sup> Max.		
Load capacitance	CL	7 pF, 9 pF, 12.5 pF		Please specify
Motional resistance (ESR)	R <sub>1</sub>	65 kΩ Max.	65 kΩ to 25 kΩ	
Motional capacitance	C <sub>1</sub>	1.9 fF Typ.	2.5 fF to 0.6 fF	
Shunt capacitance	C <sub>0</sub>	0.8 pF Typ.	1.2 pF to 0.5 pF	
Frequency aging	f <sub>age</sub>	±3 × 10 <sup>-6</sup> / year Max.	±5 × 10 <sup>-6</sup> / year Max.	+25 °C, First year

**External dimensions**

(Unit:mm)



**Footprint (Recommended)**

(Unit:mm)

