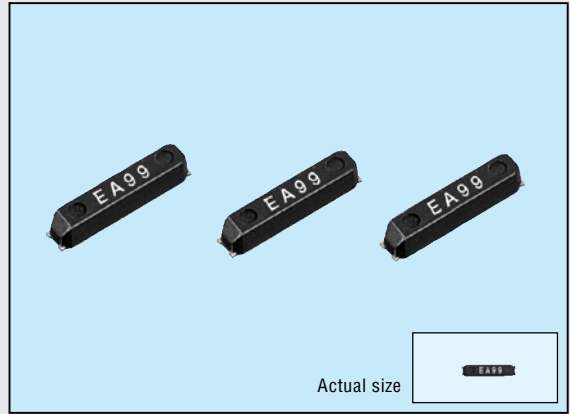


## THIN SMD LOW/MEDIUM-FREQUENCY CRYSTAL UNIT

## MC-146

- High-density mounting-type SMD of 1.4 mm thickness.
- Small packaging area and light weight.
- Excellent shock resistance and environmental capability.
- Most suitable for small communications devices.



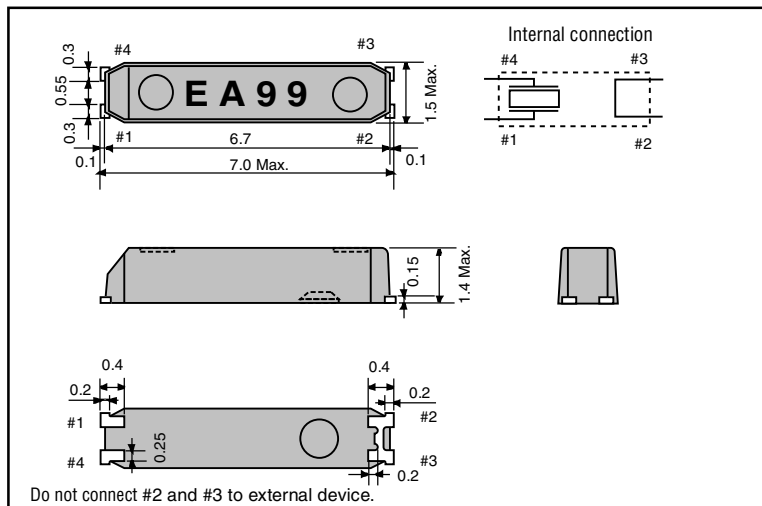
## ■ Specifications (characteristics)

Item	Symbol	Specifications		Remarks
Nominal frequency	f	32.768 kHz	75.000 kHz	please contact us for inquiries about usable frequencies
Temperature range	Storage temperature	TSTG		
	Operating temperature	TOPR		
Maximum drive level	GL	1.0 $\mu$ W Max.		Operating drive level 0.5 $\mu$ W Max.
Soldering condition	TSOL	Twice at under +260 °C within 10 s or under +230 °C within 3 min.		
Frequency tolerance(standard)	$\Delta f/f$	$\pm 20 \times 10^{-6}$ , $\pm 50 \times 10^{-6}$		Ta=+25 °C, DL=0.1 $\mu$ W
Peak temperature(frequency)	$\theta T$	+25 °C $\pm 5$ °C		
Temperature coefficient(frequency)	a	$-0.04 \times 10^{-6}/^{\circ}\text{C}^2$ Max.		
Load capacitance	CL	7 pF, 12.5 pF		Please specify
Series resistance	R <sub>1</sub>	65 k $\Omega$ Max.	30 k $\Omega$ Max.	
Motional capacitance	C <sub>1</sub>	1.9 fF Typ.		
Shunt capacitance	C <sub>0</sub>	0.8 pF Typ.		
Insulation resistance	IR	500 M $\Omega$ Min.		
Aging	fa	$\pm 3 \times 10^{-6}$ /year Max.		Ta=+25 °C $\pm 3$ °C, first year
Shock resistance	S.R.	$\pm 5 \times 10^{-6}$ Max.		Three drops on a hard board from 750 mm or excitation test with 29400 m/s <sup>2</sup> $\times$ 0.3 ms $\times$ 1/2 sine wave $\times$ 3 directions

Metal may be exposed on the top of this product. This won't affect any quality, reliability or electrical spec.

## ■ External dimensions

(Unit: mm)



## ■ Recommended soldering pattern

(Unit: mm)

