

**kHz RANGE CRYSTAL UNIT  
SMD**

**MC - 306 / 405 / 406**

- Frequency range : 32.768 kHz (20 kHz to 165 kHz)
- Thickness : 2.54 mm Max.(MC-306)  
3.60 mm Max.(MC-405 / 406)
- Overtone order : Fundamental /Overtone (307.2 kHz)
- Applications : Clock and Microcomputer
- Lead(Pb)-free : High melting temperature type solder (Pb85 %) exempted by RoHS directive.



Actual size



**Specifications (characteristics)**

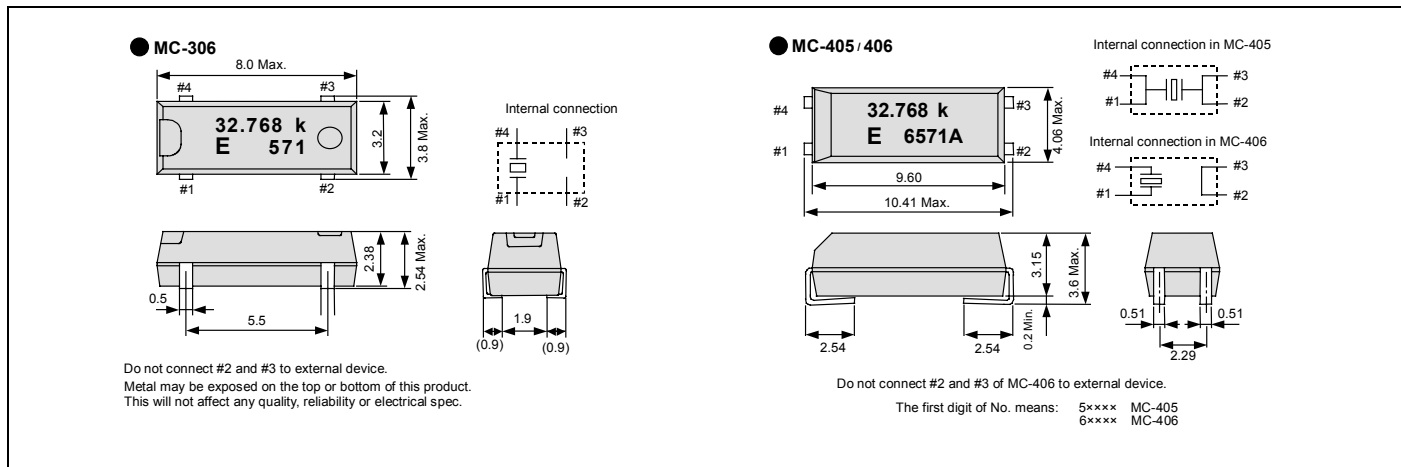
Item	Symbol	Specifications		Remarks
Nominal frequency range	f	32.768 kHz	20 kHz to 165 kHz 307.2 kHz(MC-405 / 406)	Please contact us regarding available frequencies
Temperature range	Storage temperature T <sub>stg</sub>	-55 °C to +125 °C		Stored as bare product after unpacking
	Operating temperature T <sub>use</sub>	-40 °C to +85 °C		
Level of drive	DL	1.0 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	6 pF to ∞ (standard : 12.5 pF)		Please specify
Motional resistance (ESR)	R <sub>1</sub>	50 kΩ Max.	55 kΩ to 6 kΩ	As per below table
	C <sub>1</sub>	1.8 fF Typ. 2.0 fF Typ.	4.0 fF to 0.6 fF	MC-306 MC-405 / 406
Shunt capacitance	C <sub>0</sub>	0.9 pF Typ. 0.85 pF Typ.	2.0 pF to 0.6 pF	MC-306 MC-405 / 406
	f <sub>age</sub>	±3 × 10 <sup>-5</sup> / year Max.	±5 × 10 <sup>-6</sup> / year Max.	+25 °C, First year

**Motional resistance (ESR)**

Frequency	20 kHz≤f< 31.2 kHz	31.2 kHz≤f< 40 kHz	40 kHz≤f< 90 kHz	90 kHz≤f< 130 kHz	130 kHz≤f<165 kHz	307.2 kHz
Motional resistance	55 kΩ Max.	35 kΩ Max.	20 kΩ Max.	12 kΩ Max.	10 kΩ Max.	6 kΩ Max.

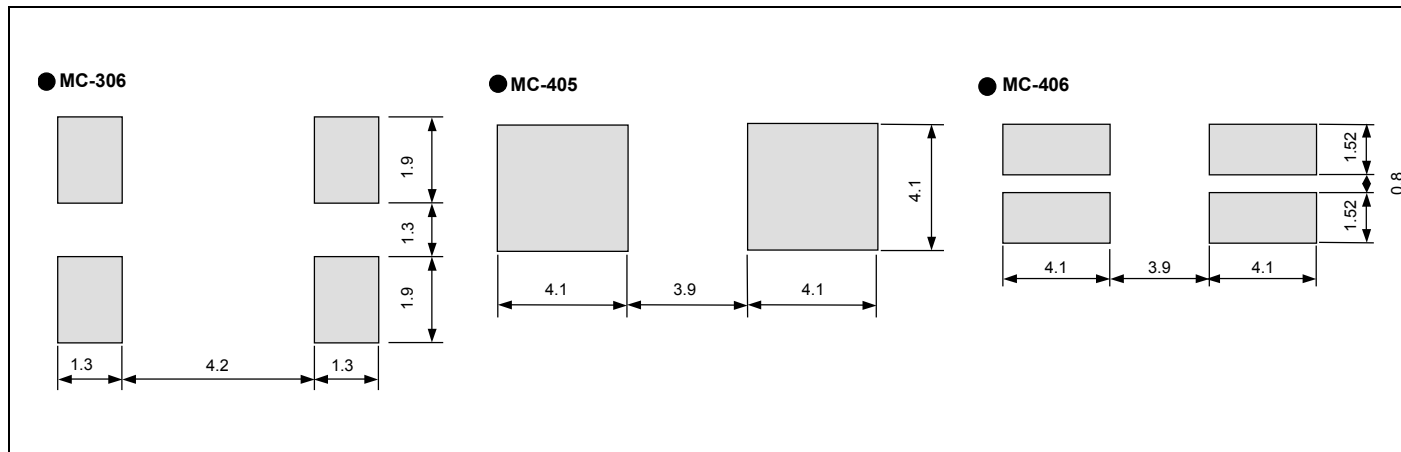
**External dimensions**

(Unit:mm)



**Footprint (Recommended)**

(Unit:mm)



# Part Numbering System

## \* Standard KHz Crystals (Tuning Fork Crystal)

