

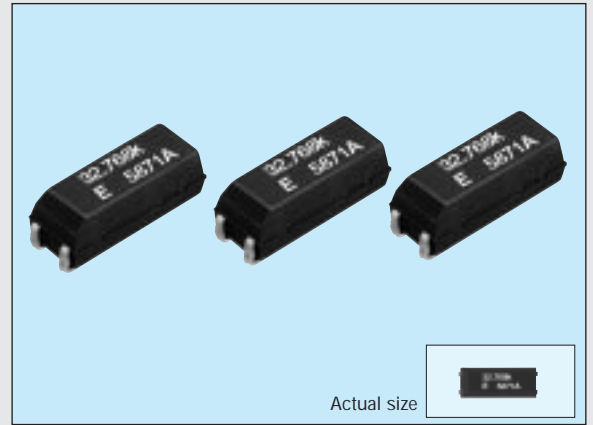
SMD LOW/MEDIUM-FREQUENCY CRYSTAL UNIT

# MC-405/406

Products number

**Q1xMC405xxxxx00**  
**Q1xMC406xxxxx00**

- High-density mounting-type SMD.
- Photolithography finished allows uniform, stable performance.
- Excellent environmental capability.
- Capable of covering low-frequency range from 20 kHz to 165 kHz.
- Suitable for time keeping of clock and microcomputer.

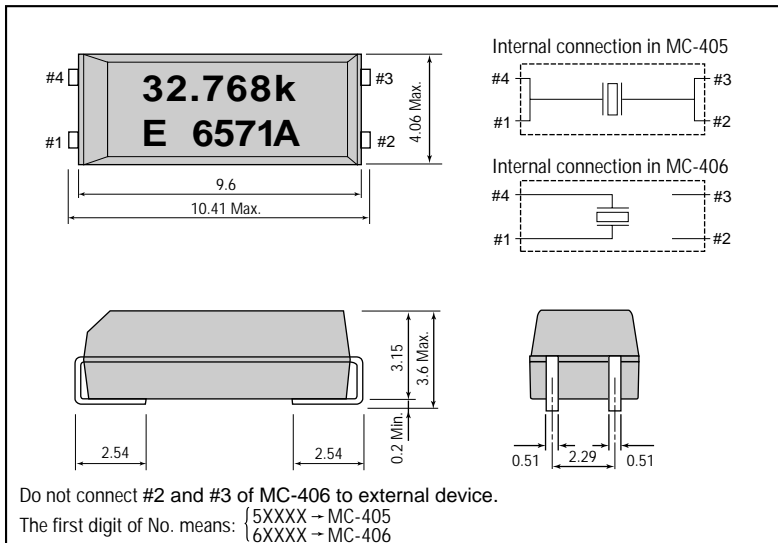


## Specifications (characteristics)

Item		Symbol	Specifications		Remarks
Nominal frequency range		f	32.768 kHz	20.000 kHz to 165.000 kHz 307.2 kHz	
Temperature range	Storage temperature	T <sub>STG</sub>	-55 °C to +125 °C		Stored as bare product after unpacking
	Operating temperature	T <sub>OPR</sub>	-40 °C to +85 °C		
Maximum drive level		GL	1.0 μW Max.		
Frequency tolerance (standard)		Δf/f	±20 x 10 <sup>-6</sup> , ±50 x 10 <sup>-6</sup>	±50 x 10 <sup>-6</sup> , ±100 x 10 <sup>-6</sup> (307.2 kHz: ±100 x 10 <sup>-6</sup> )	Ta=+25 °C, DL=0.1 μW
Turnover temperature (frequency)		θT	+25 °C ±5 °C		
Temperature coefficient (frequency)		a	-0.04 x 10 <sup>-6</sup> / °C <sup>2</sup> Max.		
Load capacitance		C <sub>L</sub>	6 pF to ∞		Please specify
Series resistance		R <sub>1</sub>	50 kΩ Max.	55 kΩ to 6 kΩ	For details, refer to page 15
Motion capacitance		C <sub>1</sub>	2.0 fF Typ.	4.0 fF to 0.6 fF	
Shunt capacitance		C <sub>0</sub>	0.85 pF Typ.	2.0 pF to 0.6 pF	
Insulation resistance		IR	500 MΩ Min.		
Aging		fa	±3 x 10 <sup>-6</sup> /year Max.	±5 x 10 <sup>-6</sup> /year Max.	Ta=+25 °C±3 °C, first year
Shock resistance		S.R.	±5 x 10 <sup>-6</sup> Max.		Three drops on a hard board from 750 mm or excitation test with 29400 m/s <sup>2</sup> x 0.3 ms x 1/2 sine wave x 3 directions

## External dimensions

(Unit: mm)



## Recommended soldering pattern

(Unit: mm)

