

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

MC-306



MC-405 / 406



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 _{stg}	-55 °C to +125 °C		Stored as bare product after unpacking
	Operating temperature	T _{use}	-40 °C to +85 °C		
Level of drive		DL	1.0 μW Max.		
Frequency tolerance (standard)		f _{tol}	±20 × 10 ⁻⁶ , ±50 × 10 ⁻⁶	±50 × 10 ⁻⁶ , ±100 × 10 ⁻⁶	+25 °C, DL=0.1 μW
Turnover temperature		T _i	+25 °C ±5 °C		
Parabolic coefficient		B	-0.04 × 10 ⁻⁶ / °C ² Max.		
Load capacitance		CL	6 pF to ∞ (standard :12.5 pF)		Please specify
Motional resistance (ESR)		R ₁	50 kΩ Max.	55 kΩ to 6 kΩ	As per below table
Motional capacitance		C ₁	1.8 fF Typ.	4.0 fF to 0.6 fF	MC-306
			2.0 fF Typ.		MC-405 / 406
Shunt capacitance		C ₀	0.9 pF Typ.	2.0 pF to 0.6 pF	MC-306
			0.85 pF Typ.		MC-405 / 406
Frequency aging		f _{age}	±3 × 10 ⁻⁶ / year Max.	±5 × 10 ⁻⁶ / year Max.	+25 °C, First year

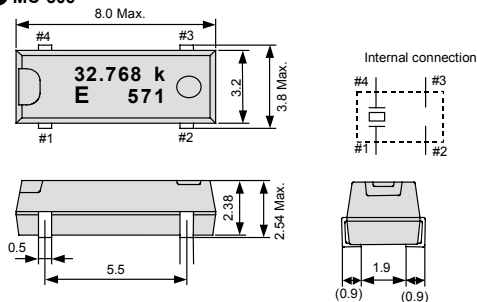
Motional resistance (ESR)

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

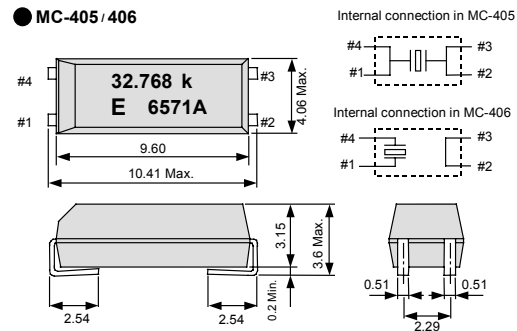
(Unit:mm)

MC-306



Do not connect #2 and #3 to external device.
Metal may be exposed on the top or bottom of this product.
This will not affect any quality, reliability or electrical spec.

MC-405 / 406



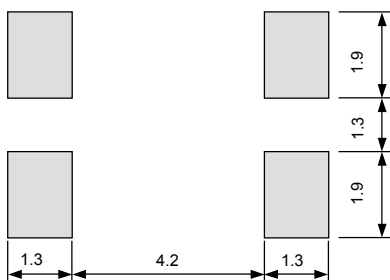
Do not connect #2 and #3 of MC-406 to external device.

The first digit of No. means: 5xxxx MC-405
6xxxx MC-406

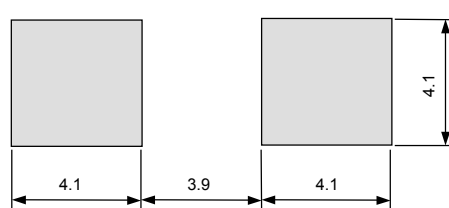
Footprint (Recommended)

(Unit:mm)

MC-306



MC-405



MC-406

