



KHz RANGE CRYSTAL UNIT SMD

MC-306 MC-405 / MC-406

- Frequency range : 32.768 kHz (20 kHz to 165 kHz)
- Thickness : 8.0 × 3.8 × 2.54 t (mm) ...MC-306
10.41 × 4.06 × 3.6 t (mm) ...MC-405 / 406
- Overtone order : Fundamental / Overtone (307.2 kHz)
- Applications : Clock and Microcomputer



Product Number (please contact us)

MC-306 : Q13MC3061xxxx00

MC-405 : Q1xMC4051xxxx00

MC-406 : Q1xMC4061xxxx00



Actual size



Specifications (characteristics)

Item	Symbol	Specifications		Remarks
Nominal frequency range	f_nom	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		Store 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	Ti	+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)	R1	50 kΩ Max.	55 kΩ to 6 kΩ	As per below table
Motional capacitance	C1	1.8 fF Typ.	4.0 fF to 0.6 fF	MC-306
		2.0 fF Typ.		MC-405 / 406
Shunt capacitance	C0	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 ⁻⁹ / year Max.	±5 × 10 ⁻⁶ / year Max.	+25 °C, First year

Motional resistance (ESR)

Frequency	20 kHz ≤ f_nom < 31.2 kHz	31.2 kHz ≤ f_nom < 40 kHz	40 kHz ≤ f_nom < 90 kHz	90 kHz ≤ f_nom < 130 kHz	130 kHz ≤ f_nom ≤ 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