

KHz RANGE CRYSTAL UNIT



Product Number (please contact us)

MC-306 : Q1xMC3062xxxx00

MC-405 : Q1xMC4052xxxx00

MC-406 : Q1xMC4062xxxx00

MC - 306
MC - 405 / MC - 406

- Frequency range : 32.768 kHz (20 kHz to 120 kHz)
- Thickness : 8.0 × 3.8 × 2.54 mm ...MC-306
10.41 × 4.06 × 3.6 mm ...MC-405 / 406
- Overtone order : Fundamental
- Applications : Clock and Microcomputer



Actual size



Specifications (characteristics)

| Item | Symbol | Specifications | | Conditions / Remarks |
|--------------------------------|----------------|---|--|--|
| Nominal frequency range | f_nom | 32.768 kHz | 20 kHz to 120 kHz | Please contact us about available frequencies. |
| Storage temperature | T_stg | -55 °C to +125 °C | | Storage as single product. |
| 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) | R ₁ | 50 kΩ Max. | As per table below | |
| 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 _{nom} < 31.2 kHz | 31.2 kHz ≤ f _{nom} < 40 kHz | 40 kHz ≤ f _{nom} < 90 kHz | 90 kHz ≤ f _{nom} ≤ 120 kHz |
|---------------------|--------------------------------------|--------------------------------------|------------------------------------|-------------------------------------|
| Motional resistance | 55 kΩ Max. | 35 kΩ Max. | 20 kΩ Max. | 12 kΩ Max. |

Product name MC-306 32.768000kHz 12.5 +20.0-20.0

(Standard form)

- ① Model ② Frequency ③ Load capacitance(pF) ④ Frequency tolerance(x 10⁻⁶, +25 °C)

External dimensions

(Unit:mm)

● MC-306

8.0 Max.
3.2 Max.
3.8 Max.
2.38 Max.
2.54 Max.
0.5
5.5
1.9
(0.9) (0.9)

● MC-405 / 406

4.06 Max.
9.60
10.41 Max.
3.15 Max.
3.6 Max.
0.2 Min.
2.54
2.54
0.51
0.51
2.29

Internal connection (TOP VIEW) for MC-306 and MC-405/406 showing pins #1, #2, #3, #4.

Do not connect #2 and #3 to external device.
The metal case inside of the molding compound may be exposed on the top or bottom of this product.
This purely cosmetic and does not have any effect on quality, reliability or electrical specs.

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

1.3, 4.2, 1.3, 1.9, 1.3, 1.9

● MC-405

4.1, 3.9, 4.1, 4.1

● MC-406

4.1, 3.9, 4.1, 1.52, 1.52, 0.8