SMD LOW / MEDIUM-FREQUENCY CRYSTAL UNIT

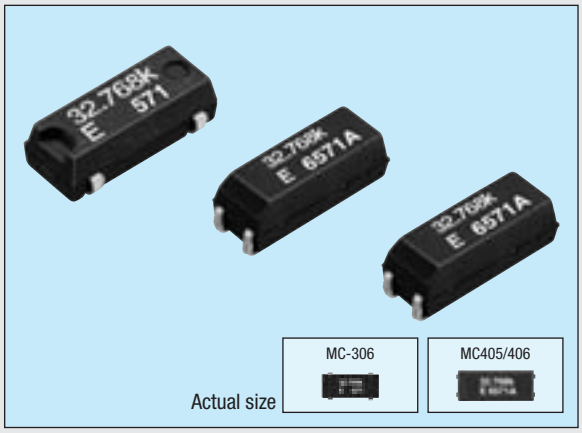
MC-306 / 405 / 406

Product number (please refer to page 1)

Q1xMC306xxxxx00

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.
- Available for lead (Pb)-free soldering.
- Available for lead (Pb)-free terminal.



■ Specifications (characteristics)

Item		Symbol	Specifications		Remarks
Nominal frequency range		f	32.768 kHz	20.000 kHz to 165.000 kHz	Please refer to frequency example page 14
Temperature range	Storage temperature	TSTG	-55 ºC to +125 ºC		Stored as bare product after unpacking
	Operating temperature	TOPR	-40 ºC to +85 ºC		
Maximum drive level		GL	1.0 µW Max.		
Frequency tolerance (standard)		Δf/f	±20 x 10^{-6}, ±50 x 10^{-6}	±50 x 10^{-6}, ±100 x 10^{-6}	Ta = +25 ºC, DL = 0.1 µW
Peak temperature (frequency)		θT	+25 ºC ±5 ºC		
Temperature coefficient (frequency)		a	-0.04 x 10^{-6} / ºC² Max.		
Load capacitance		CL	6 pF to ∞ (Standard : 12.5 pF)		Please specify
Series resistance		R1	50 kΩ Max.	55 kΩ to 10 kW	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
Insulation resistance		IR	500 MΩ Min.		
Aging		fa	±3 x 10^{-6} / year Max.	±5 x 10^{-6} / year Max.	Ta = +25 ºC ±3 ºC, first year
Shock resistance		S.R.	±5 x 10^{-6} Max.		Three drops on a hard board from 750 mm or excitation test with 29400 m/s² x 0.3 ms x 1/2 sine wave x 3 directions

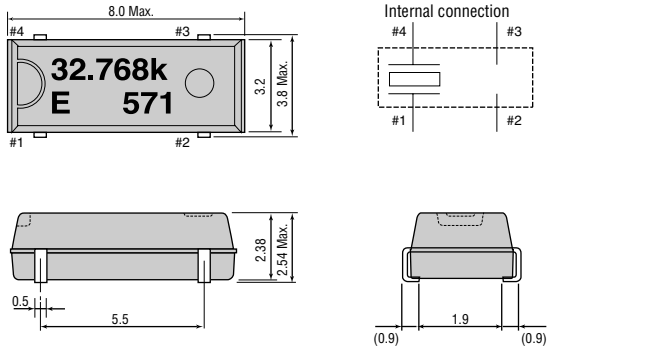
■ Series resistance

Frequency (kHz)	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
Series resistance (Ω)	55 kΩ Max.	35 kΩ Max.	20 kΩ Max.	12 kΩ Max.	10 kΩ Max.

■ External dimensions

(Unit: mm)

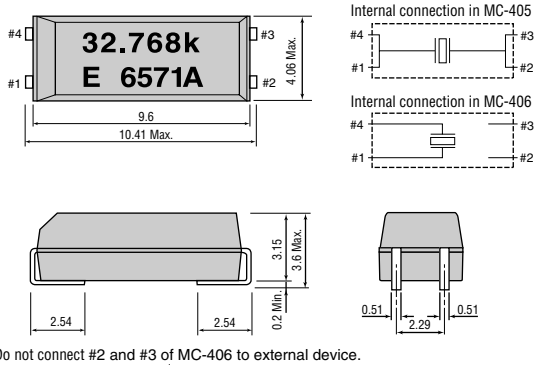
● MC-306



Do not connect #2 and #3 to external device.

Metal may be exposed on the top or bottom of this product. This won't affect any quality, reliability or electrical spec.

● MC-405/406



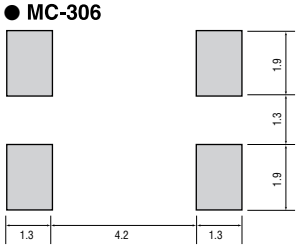
Do not connect #2 and #3 of MC-406 to external device.

The first digit of No. means: 5XXXX → MC-405, 6XXXX → MC-406

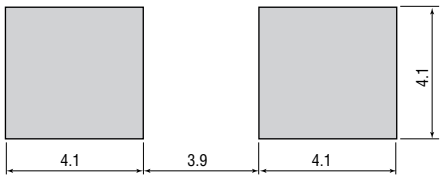
■ Recommended soldering pattern

(Unit: mm)

● MC-306



● MC-405



● MC-406