Crystal unit

SEIKO EPSON CORPORATION

(Unit:mm)

(Unit:mm)

kHz RANGE CRYSTAL UNIT MC-306 / MC-306 TYPE MC-405 / MC-405 TYPE MC-406 / MC-406 TYPE

 Frequency range 		MC-306 / 405 / 406… 32.768 kHz
	:	MC-306 / 405 /406TYPE ··· 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



Specifications (characteristics)

		Specifications			
Item	Symbol	MC-306 / 405 / 406	MC-306 / 405 /406 TYPE	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	$\pm 20 imes 10^{-6}, \pm 50 imes 10^{-6}$	$\pm 50 imes 10^{-6}, \pm 100 imes 10^{-6}$	+25 °C, DL=0.1 μW	
Turnover temperature	Ti	+25 °C ±5 °C			
Parabolic coefficient	В	-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.	As per table below		
Motional capacitance	C1	1.8 fF Typ.	4.0 fF to 0.6 fF	MC-306	
	U 1	2.0 fF Typ.		MC-405 / 406	
Shunt capacitance	Co	0.9 pF Typ.	2.0 pF to 0.6 pF	MC-306	
	C 0	0.85 pF Typ.		MC-405 / 406	
Frequency aging	f_age	$\pm 3 \times 10^{-6}$ / year Max.	$\pm 5 \times 10^{-6}$ / year Max.	+25 °C, First year	

MC-306 /405 /406 TYPE 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.
Developed as a second				

Product name (Standard form)

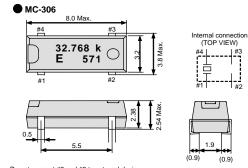
<u>32.768000kHz</u> <u>12.5</u> <u>+20.0-20.0</u> <u>MC-306</u> 1 2

3 4

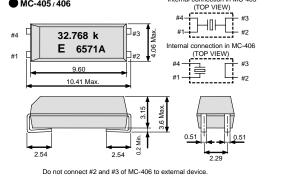
④Frequency tolerance(× 10⁻⁶, +25 °C) ③Load capacitance(pF) Model ②Frequency

MC-405 / 406

External dimensions

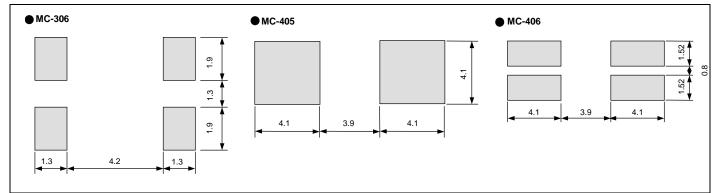


Do not connect #2 and #3 to external device. The metal case inside of the molding compound may be exposed on the top or bottom of this product. This purely cosmetic and does not have any effect on quality, reliability or electrical specs.



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

Footprint (Recommended)



PROMOTION OF ENVIRONMENTAL MANAGEMENT SYSTEM CONFORMING TO INTERNATIONAL STANDARDS

At Seiko Epson, all environmental initiatives operate under the Plan-Do-Check-Action (PDCA) cycle designed to achieve continuous improvements. The environmental management system (EMS) operates under the ISO 14001 environmental management standard.

All of our major manufacturing and non-manufacturing sites, in Japan and overseas, completed the acquisition of ISO 14001 certification.

WORKING FOR HIGH QUALITY

In order provide high quality and reliable products and services than meet customer needs,

Seiko Epson made early efforts towards obtaining ISO9000 series certification and has acquired ISO9001 for all business establishments in Japan and abroad. We have also acquired ISO/TS 16949 certification that is requested strongly by major automotive manufacturers as standard.

Explanation of the mark that are using it for the catalog

ISO 14000 is an international standard for environmental management that was established by the International Standards Organization in 1996 against the background of growing concern regarding global warming, destruction of the ozone layer, and global deforestation.

ISO/TS16949 is the international standard that added the sector-specific supplemental requirements for automotive industry based on ISO9001.

Pb Free	► Pb free.
RoHS	 Complies with EU RoHS directive. *About the products without the Pb-free mark. Contains Pb in products exempted by EU RoHS directive. (Contains Pb in sealing glass, high melting temperature type solder or other.)
For Automotive	► Designed for automotive applications such as Car Multimedia, Body Electronics, Remote Keyless Entry etc.
Automotive Safety	► Designed for automotive applications related to driving safety (Engine Control Unit, Air Bag, ESC etc).

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Epson:

 MC-306 32.7680K-A:ROHS
 MC-306 32.7680K-A0: PURE SN
 MC-306 32.7680K-A3:ROHS
 MC-306 32.7680K-AC3:

 ROHS
 MC-306 32.7680K-AE0: ROHS
 MC-306 32.7680K-E0: PURE SN
 MC-306 32.7680K-E0: ROHS
 MC-306

 32.7680K-E3: PURE SN
 MC-306 32.7680K-E3: ROHS
 MC-306 32.7680K-A0: ROHS
 MC-306
 32.7680K-E3: ROHS