



## kHz RANGE CRYSTAL UNIT For Automotive



Product Number (please contact us)  
X1A000091xxxx00

# FC-13A

- Frequency range : 32.768 kHz
- External dimensions :  $3.2 \times 1.5 \times 0.9$  mm
- Overtone order : Fundamental
- Applications : Car audio, ECU sub clock,  
Car navigation system, Clock
- Conforms to AEC-Q200



Actual size



### Specifications (characteristics)

| Item                           | Symbol         | Specifications                                                              | Conditions / Remarks                              |
|--------------------------------|----------------|-----------------------------------------------------------------------------|---------------------------------------------------|
| Nominal frequency range        | f_nom          | 32.768 kHz                                                                  |                                                   |
| Storage temperature            | T_stg          | -55 °C to +125 °C                                                           | Storage as single product.                        |
| Operating temperature          | T_use          | -40 °C to +125 °C                                                           |                                                   |
| Level of drive                 | DL             | 0.5 $\mu$ W (1.0 $\mu$ W Max.)                                              | Please contact us if you require 1.0 $\mu$ W Max. |
| Frequency tolerance (standard) | f_tol          | $\pm 20 \times 10^{-6}$ , $\pm 30 \times 10^{-6}$ , $\pm 50 \times 10^{-6}$ | +25 °C, DL=0.1 $\mu$ W                            |
| Turnover temperature           | Ti             | +25 °C $\pm$ 5 °C                                                           |                                                   |
| Parabolic coefficient          | B              | $-0.04 \times 10^{-6}$ / °C <sup>2</sup> Max.                               |                                                   |
| Load capacitance               | CL             | 9 pF, 12.5 pF                                                               | Please specify                                    |
| Motional resistance (ESR)      | R <sub>1</sub> | 70 k $\Omega$ Max.                                                          |                                                   |
| Motional capacitance           | C <sub>1</sub> | 3.2 fF Typ.                                                                 |                                                   |
| Shunt capacitance              | C <sub>0</sub> | 0.9 pF Typ.                                                                 |                                                   |
| Frequency aging                | f_age          | $\pm 3 \times 10^{-6}$ / year Max.                                          | +25 °C, First year                                |

Product name FC-13A 32.768000kHz 12.5 +20.0-20.0

(Standard form)

①

②

③

④

①Model

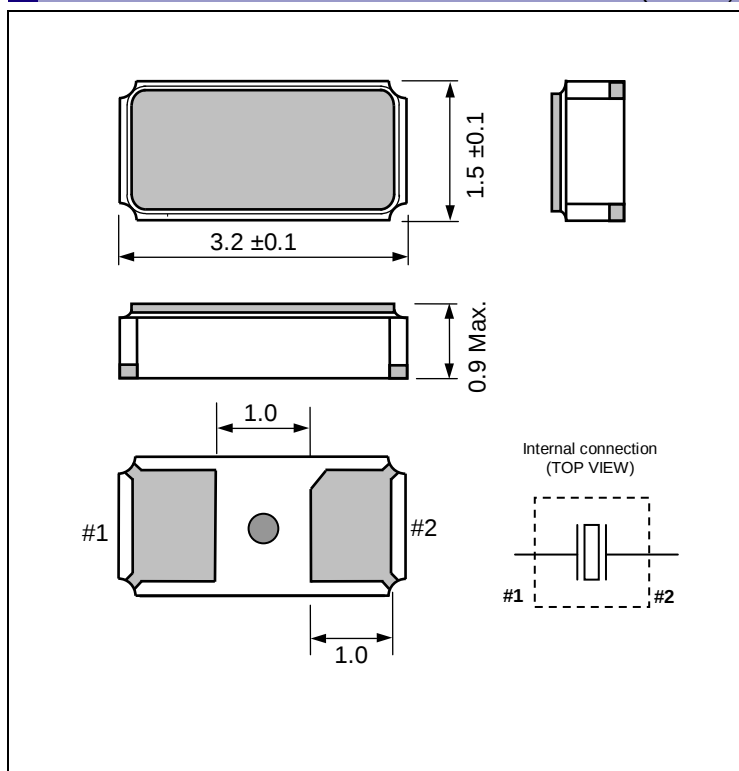
②Frequency

③Load capacitance(pF)

④Frequency tolerance( $\times 10^{-6}$ , +25 °C)

### External dimensions

(Unit:mm)



### Footprint (Recommended)

(Unit:mm)

