



## kHz RANGE CRYSTAL UNIT LOW PROFILE SMD

### FC-13D / FC-13E

- Frequency range : 32.768 kHz
- External dimensions :  $3.2 \times 1.5 \times 0.38$  t (mm) ...FC-13D  
:  $3.2 \times 1.5 \times 0.48$  t (mm) ...FC-13E
- Overtone order : Fundamental
- Applications : Small communications devices  
Smart Card



Product Number (please contact us)

FC-13D : X1Axxxxxxxxx00

FC-13E : X1A000041xxxx00



Actual size

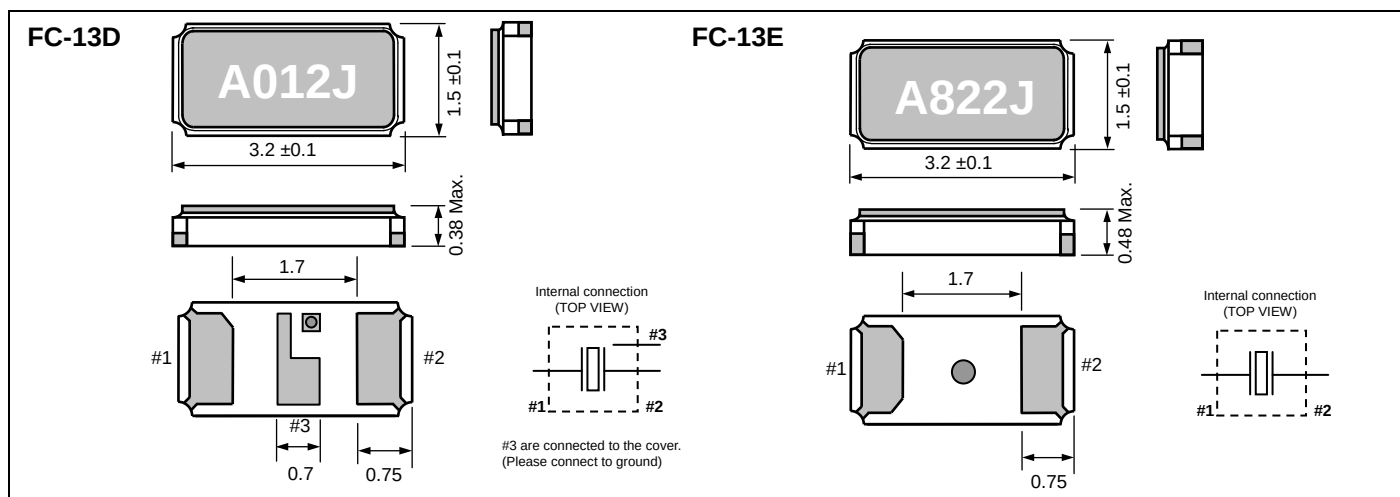
**NEW**

#### Specifications (characteristics)

| Item                           |                       | Symbol | Specifications                                  |                         | Remarks                                               |
|--------------------------------|-----------------------|--------|-------------------------------------------------|-------------------------|-------------------------------------------------------|
|                                |                       |        | FC-13D                                          | FC-13E                  |                                                       |
| Nominal frequency range        |                       | f_nom  | 32.768 kHz                                      |                         |                                                       |
| 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     | 0.5 μW Max.                                     |                         |                                                       |
| Frequency tolerance (standard) |                       | f_tol  | ±20 × 10 <sup>-6</sup>                          | ±100 × 10 <sup>-6</sup> | +25 °C, DL=0.1 μW<br>Please ask for tighter tolerance |
| Turnover temperature           |                       | Ti     | +25 °C ±5 °C                                    |                         |                                                       |
| Parabolic coefficient          |                       | B      | -0.04 × 10 <sup>-6</sup> / °C <sup>2</sup> Max. |                         |                                                       |
| Load capacitance               |                       | CL     | 7 pF, 9 pF, 12.5 pF                             | 9 pF, 12.5 pF           | Please specify                                        |
| Motional resistance (ESR)      |                       | R1     | 75 kΩ Max.                                      |                         |                                                       |
| Motional capacitance           |                       | C1     | 3.2 fF Typ.                                     | 3.4 fF Typ.             |                                                       |
| Shunt capacitance              |                       | C0     | 1.0 pF Typ.                                     |                         |                                                       |
| Frequency aging                |                       | f_age  | ±3 × 10 <sup>-6</sup> / year Max.               |                         | +25 °C, First year                                    |

#### External dimensions

(Unit:mm)



#### Footprint (Recommended)

(Unit:mm)

