# **kHz RANGE CRYSTAL UNIT** LOW PROFILE SMD

## FC - 12D/FC - 12M

•Frequency range : 32.768 kHz (32 kHz to 77.5 kHz)
•External dimensions : 2.05 x 1.25 x 0.35 mm···FC-12D
: 2.05 x 1.2 x 0.6 mm···FC-12M

•Overtone order : Fundamental

•Applications : Smart card, Small devices···FC-12D

: Small devices...FC-12M





Product Number (please contact us) FC-12D: X1A000111xxxx00 FC-12M: X1A0000x1xxxx00





Actual size

FC-12D FC-12M

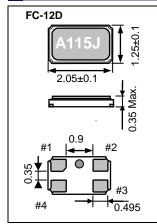
max max

#### Specifications (characteristics)

Item	Symbol	Specifications			Conditions / Domonto
		FC-12D	FC-12M		Conditions / Remarks
Nominal frequency range	f_nom	32.768 kHz	32.768 kHz	32 kHz to 77.5 kHz	Please contact us for inquiries regarding available frequency.
Storage temperature	T_stg		-55 °C to +125 °C		Store as bare product.
Operating temperature	T_use		-40 °C to +85 °C		
Level of drive	DL	0.25 μW Max.	0.5 μW Max.		
Frequency tolerance (standard)	f_tol	±20 × 10 <sup>-6</sup>	±20 × 10 <sup>-6</sup> ±30 × 10 <sup>-6</sup>		+25 °C, DL=0.1 μW Please ask for tighter tolerance
Turnover temperature	Ti	+25 °C ±5 °C			
Parabolic coefficient	В	$-0.04 \times 10^{-6} / {}^{\circ}\text{C}^{2}\text{Max}.$			
Load capacitance	CL	7 pF, 9pF, 12.5pF	12.5pF		Please specify
Motional resistance (ESR)	R1	75 kΩ Max.	90 kΩ Max.	90 k $\Omega$ to 65 k $\Omega$	
Motional capacitance	C1	3.7 fF Typ.	6.4 fF Typ.	7.0 fF to 2.7 fF	
Shunt capacitance	C <sub>0</sub>	0.8 pF Typ.	1.3 pF Typ.	1.6 pF to 0.8pF	
Frequency aging	f_age	±3 × 10 <sup>-6</sup> / year Max.			+25 °C, First year

#### External dimensions

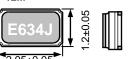
(Unit: mm)



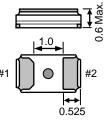
#4 ---- #3

#2 is connected to cover. Please connect to GND. Do not connect #4 externally.

### FC-12M

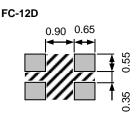




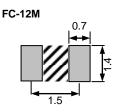


#### Footprint (Recommended)

(Unit: mm)



\*Do not design any pattern on shaded



\*Do not design any pattern on shaded