



## KHz RANGE CRYSTAL UNIT



Product Number (please contact us)

FC-12D: X1A000111xxxx00

FC-12M: X1A0000x1xxxx00

## FC - 12D / FC - 12M

- Frequency range : 32.768 kHz (32 kHz to 77.5 kHz)
- External dimensions : 2.05 × 1.25 × 0.35 mm...FC-12D  
2.05 × 1.2 × 0.6 mm...FC-12M
- Overtone order : Fundamental
- Applications : Smart card (Please contact us for  
except Smart card use.)...FC-12D  
: Small devices...FC-12M



Actual size



## Specifications (characteristics)

Item	Symbol	Specifications			Conditions / Remarks
		FC-12D	FC-12M		
Nominal frequency range	f <sub>nom</sub>	32.768 kHz	32.768 kHz	32 kHz to 77.5 kHz	Please contact us about available frequencies.
Storage temperature	T <sub>stg</sub>	-55 °C to +125 °C			Storage as single product.
Operating temperature	T <sub>use</sub>	-40 °C to +85 °C			
Level of drive	DL	0.25 μW Max.	0.5 μW Max.		
Frequency tolerance (standard)	f <sub>tol</sub>	±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	T <sub>i</sub>	+25 °C ±5 °C			
Parabolic coefficient	B	-0.04 × 10 <sup>-6</sup> / °C <sup>2</sup> Max.			
Load capacitance	CL	7 pF, 9pF, 12.5pF	12.5pF		Please specify
Motional resistance (ESR)	R <sub>1</sub>	75 kΩ Max.	90 kΩ Max.	90 kΩ to 65 kΩ	
Motional capacitance	C <sub>1</sub>	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 <sub>age</sub>	±3 × 10 <sup>-6</sup> / year Max.			+25 °C, First year

Product name FC-12D 32.768000kHz 12.5 +20.0-20.0  
(Standard form) ① ② ③ ④

①Model ②Frequency ③Load capacitance(pF) ④Frequency tolerance(× 10<sup>-6</sup>, +25 °C)

## External dimensions

(Unit: mm)

FC-12D	FC-12M
<p>#4 #3 #1 #2</p> <p>Pin #2 is connected to the device lid. Please connect to GND. Do not connect #4 externally.</p>	<p>Internal connection (TOP VIEW) #1 #2</p>

## Footprint (Recommended)

(Unit: mm)

FC-12D	FC-12M
<p>*Do not design any circuit patterns in the shaded area.</p>	<p>*Do not design any circuit patterns in the shaded area.</p>