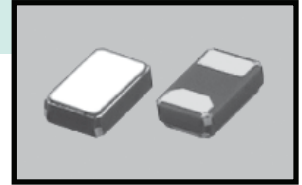


Quartz Crystal Resonator (32.768KHz)



TF2012

General Description

The TF2012 is a low frequency SMT Quartz Crystal Unit that incorporates a tuning fork Quartz Crystal Resonator. It operates under vacuum in a hermetically sealed ceramic package with ceramic lid.

Features

High stability and low aging guaranteed by hermetic sealing. Available for extended operating temperature range. Small size, low profile, lightweight. High shock and vibration resistant. 100% Pb-free, RoHS-compliant

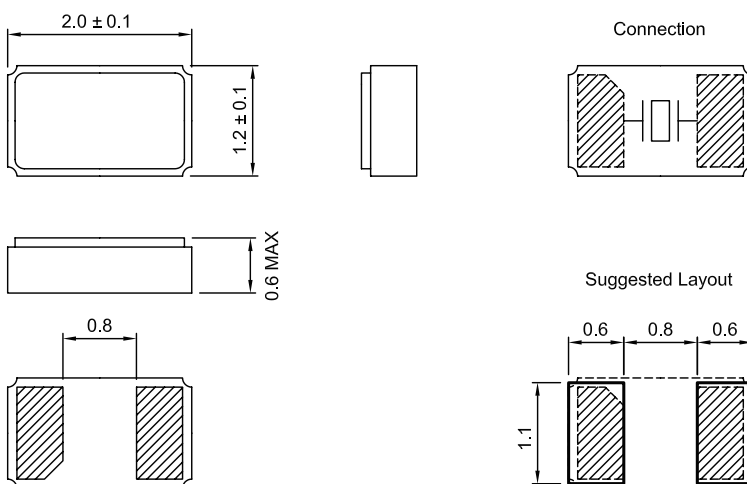
Main Applications

Mobile phone, Notebook, Metering

Electrical characteristics

Item	Symbol	Values
Part number		TF2012
Nominal frequency	F	32.768 KHz
Frequency tolerance (@ +25°C)	$\Delta f/F$	$\pm 10 / 15 / \mathbf{20}$ ppm
Frequency stability	$\Delta f/F$	-0.034 ppm/°C ²
Operating temp. range	To	-40°C / +85°C
Storage temp. range	Ts	-55°C / +125°C
Load capacitance	Cl	7.0 / 9.0 / 12.5
Equivalent serie resistance	ESR	90 K Ω max
Shunt capacitance	CO	1.2pF (typical)
Motional capacitance	C1	0.0064pF (typical)
Drive level	P	0.5 μ W max
Turnover temperature	Tt	+25°C \pm 5°C
Quality factor	Q	20000 min.
Aging	$\Delta f/F$	± 3 ppm max @ +25°C

Dimensions



Units: mm

TF2012

Part Number Generator

TF2012 - 0.032768 P12.5 C N TR xxx

1 2 3 4 5 6

1 : Frequency (MHz)

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max 10 digits including comma

2 : Load capacitance

P7 = 7pF
 P9 = 9pF
 P12.5 = 12.5pF

3 : Tolerance

C= $\leq \pm 20$ ppm
 D= $\leq \pm 15$ ppm
 E= $\leq \pm 10$ ppm

4 : Op. Temp. range

N=-40/+85

5 : Packing

TR = Tape & Reel (3K pcs)

6 : Customized code

Note : factory use