

## Quartz Crystal Resonator (32.768KHz)

## TF2012A

AUTOMOTIVE, AEC-Q200

**General Description**

The TF2012A 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 metal lid.

**Features**

Ultra small size, low profile, lightweight (4.6 mg).  
 Outstanding hermetic sealing with gold-tin preform.  
 High stability and low aging guaranteed by hermetic sealing.  
 Available for extended operating temperature range.  
 High shock and vibration resistant.  
 100% Pb-free, RoHS-compliant

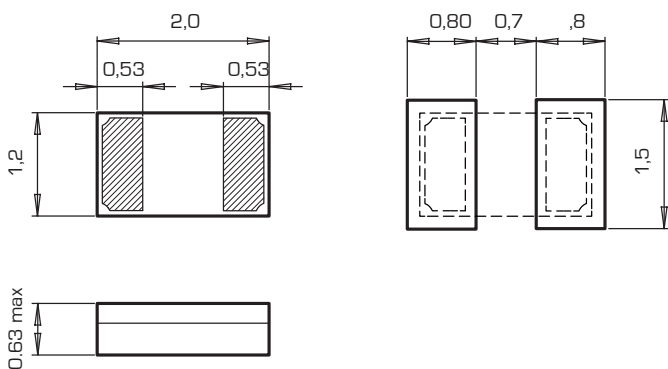
**Main Applications**

AUTOMOTIVE dashboard

## Electrical characteristics

Item	Symbol	Values
Part number		TF2012A
Nominal frequency	F	32.768 KHz
Frequency tolerance (@ +25°C)	$\Delta f/F$	$\pm 20$ ppm
Frequency stability	$\Delta f/F$	$-0.034$ ppm/°C <sup>2</sup>
Operating temp. range	To	-40°C / +85°C
Storage temp. range	Ts	-55°C / +125°C
Load capacitance	Cl	4.0 / 6.0 / 7.0 / 9.0 / <b>12.5</b>
Equivalent serie resistance	ESR	55 / 75 K $\Omega$
Shunt capacitance	CO	1.2pF [typical]
Motional capacitance	C1	4.0fF [typical]
Drive level	P	0.5 $\mu$ W max
Turnover temperature	Tt	+25°C $\pm$ 5°C
Quality factor	Q	20000
Aging	$\Delta f/F$	$\pm 3$ ppm max @ +25°C

## Dimensions



# TF2012A

## Part Number Generator

**TF2012A - 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

P4 = 4pF  
 P6 = 6pF  
 P7 = 7pF  
 P9 = 9pF  
 P12.5 = 12.5pF

**3** : Tolerance

C= ≤±20ppm

**4** : Op. Temp. range

N=-40/+85

**5** : Packing

TR = Tape & Reel (3K pcs)

**6** : Customized code

Note : factory use