



actual size

# Quartz Crystal · MMTF32

Tuning Fork Crystal · 2.0 x 6.0 mm

- 2 x 6 mm cylinder type
- 32.768 kHz standard



## General Data

type	MMTF32
frequency	32.768 kHz
frequency tolerance at 25 °C ± 5 °C	± 10 ppm / ± 20 ppm
load capacitance $C_L$	10 pF / 12.5 pF std. (6 pF ~ 12.5 pF on request)
temperature constant ( $T_C$ )	$T_C = -0.04 \text{ ppm} / ^\circ\text{C}^2 \text{ max.}$ $T_C = -0.034 \text{ ppm} / ^\circ\text{C}^2 \text{ typical}$
frequency temperature characteristic	$\Delta f = T_C \cdot (T_A - T_{TP})^2 \text{ in [ppm]}$ $T_A = \text{actual ambient temperature}$ $T_{TP} = 25 \text{ }^\circ\text{C} \pm 5 \text{ }^\circ\text{C}$ $T_{TP} = \text{turning point temperature}$
operating temperature range	-20 °C ~ +70 °C / -40 °C ~ +85 °C
shunt capacitance $C_0$	1.2 pF typical
series resistance max. (ESR)	40.0 kΩ (35.0 kΩ ask if available)
storage temperature	-40 °C ~ +90 °C
drive level max.	1 μW
aging first year	< ± 5 ppm

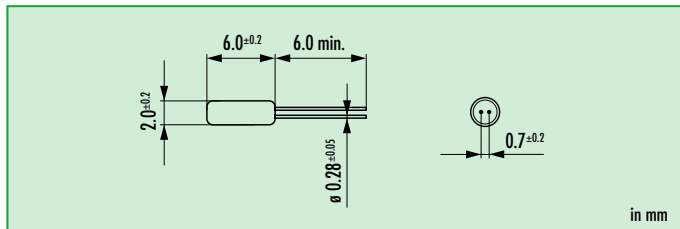
## Frequency Stability vs. Temperature

		-80 ppm	-160 ppm	
-20 °C ~ +70 °C	STD.	●		
-40 °C ~ +85 °C	T1		●	
● standard				

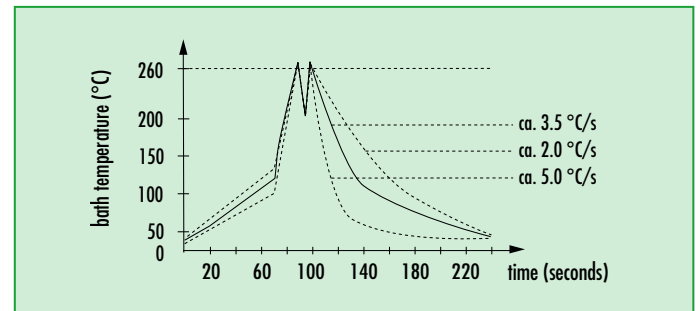
## Marking

company code  
date code  
internal code (optional)

## Dimensions

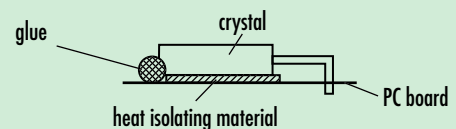


## Wave Soldering Profile



## Mounting

**Mounting:** if the crystal should be mounted vertically to your board (see picture), do not directly solder the metal can. The crystal may be overheated by the direct heat flow. Please use glue (hot-melt adhesive) or mechanical clamping to fasten the metal can.



## Order Information

Q	frequency	type	load capacitance	stability at 25 °C	option
Quartz	0.032768 MHz	MMTF32	6 pF ~ 12.5 pF 10.0 pF Std. 12.5 pF Std.	20 = ± 20 ppm 10 = ± 10 ppm	blank = -20 °C ~ +70 °C T1 = -40 °C ~ +85 °C

Example: Q 0.032768-MMTF32-12.5-20-LF (Suffix LF = RoHS compliant / Pb free pads)