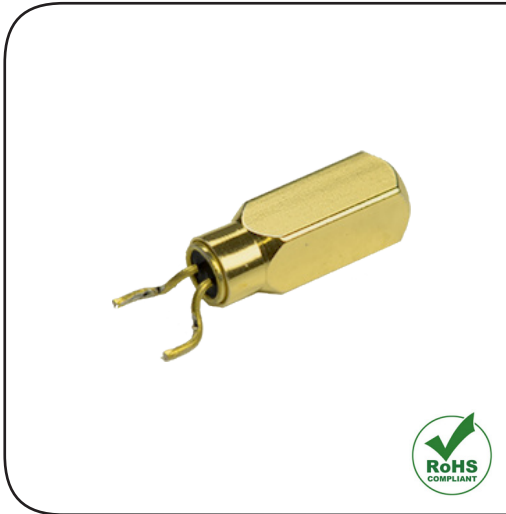
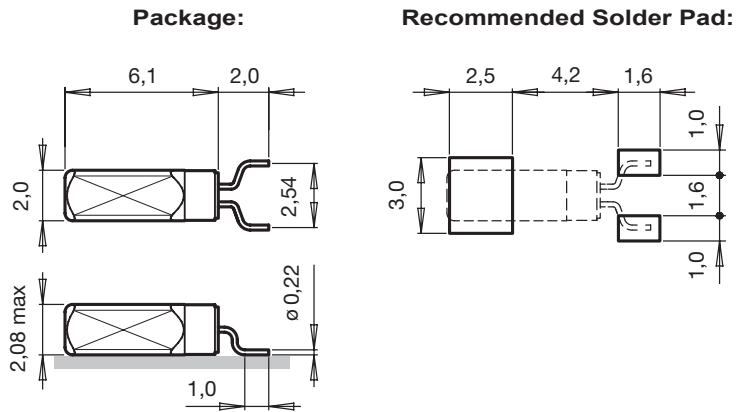


# MS1V-T1K

Tuning Fork Crystal 30 kHz – 200 kHz



## DIMENSIONS



All dimensions in mm typical

## APPLICATIONS

IoT  
Metering  
Wearables  
Health Care  
Consumer Electronics

## DESCRIPTION

The MS1V-T1K is a low frequency surface mount technology Quartz Crystal Unit that incorporates a tuning fork Quartz Crystal Resonator. It operates under vacuum in a hermetically sealed square-bodied metal can package.

## FEATURES

High stability is guaranteed by hermetic sealing.  
High shock and vibration resistant.  
Proven surface mount technology package for reflow soldering.  
Excellent lead coplanarity for surface mounting.  
RoHS-compliant.

## ELECTRICAL CHARACTERISTICS AT 25°C

Standard Frequency	<sup>1)</sup> $F_L$	32.768	kHz
Load capacitance	<sup>2)</sup> $C_L$	6.0 / 7.0 / 9.0 / 12.5	pF
Frequency tolerance	<sup>3)</sup> $\Delta F/F$	±20	ppm
	$\Delta F/F$	±100	ppm
Series resistance typ./max.	$R_S$	45 / 60	kΩ
Motional capacitance typ.	$C_1$	2.25	fF
Static capacitance typ.	$C_0$	0.9	pF
Drive level max.	P	1.0	μW
Insulation resistance min.	$R_i$	500	MΩ
Aging first year max.	$\Delta F/F$	±3	ppm
Turnover temperature	$T_0$	25 ±5	°C
Frequency vs. temperature	$\Delta F/F_0$	$-0.035 \text{ ppm}/^\circ\text{C}^2 (T - T_0)^2 \pm 10\%$	ppm

- 1) Other frequencies on request.  
2) Other load capacitances on request.  
3) Tighter and wider frequency tolerances on request.

**STANDARD FREQUENCIES**

Frequencies		
32.768 kHz	60.000 kHz	76.800 kHz
Other frequencies on request		

**ENVIRONMENTAL CHARACTERISTICS**

		Conditions	Max. Dev.
Storage temperature range		-55 to +85°C	
TA Operating temperature range		-40 to +85°C	
Shock resistance	ΔF/F	5000 g, 0.3 ms, ½ sine	±5 ppm
Vibration resistance	ΔF/F	20 g / 10–2000 Hz	±5 ppm

**TERMINATIONS AND PROCESSING**

Type	Termination	Processing
MS1V-T1K	Can: Au flashed Leads: Formed leads Au flashed	For surface mounting IPC/JEDEC J-STD-020C 260°C / 20 - 40 s
MS1V-T1N	Can: Au flashed Leads: Straight leads Au flashed	For through-hole mounting IPC/JEDEC J-STD-020C 260°C / 20 - 40 s

**ORDERING INFORMATION**

**MS1V-T1K 32.768 kHz 12.5 pF ±20 ppm TA QC Au**

**Square metal package**  
MS1V = 2.0 x 2.0 x 6.1 mm

**SMT Package**

**Au flashed leads**

**Package lead form**  
K = SMD spacing 2.54 mm  
N = Straight leads

**Frequency  $F_L$**   
32.768 kHz

**Load capacitance  $C_L$**   
6.0 pF  
7.0 pF  
9.0 pF  
12.5 pF  
Other  $C_L$  on request

**Frequency tolerance**  
±20 ppm  
±100 ppm  
Tighter and wider freq. tolerances on request

**Temperature range**  
TA = -40 to +85°C

**Qualification**  
QC = Commercial Grade

**Au flashed can**

A unique part number will be generated for each product specification, i.e:		
20xxx-ML02	2'000 pcs (in 16 mm tape on 7" reel)	MS1V-T1K
20xxx-PL08	8'000 pcs (in 16 mm tape on 13" reel)	MS1V-T1K
20xxx-BA01	1'000 pcs (in plastic bag)	MS1V-T1N

All specifications subject to change without notice.



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