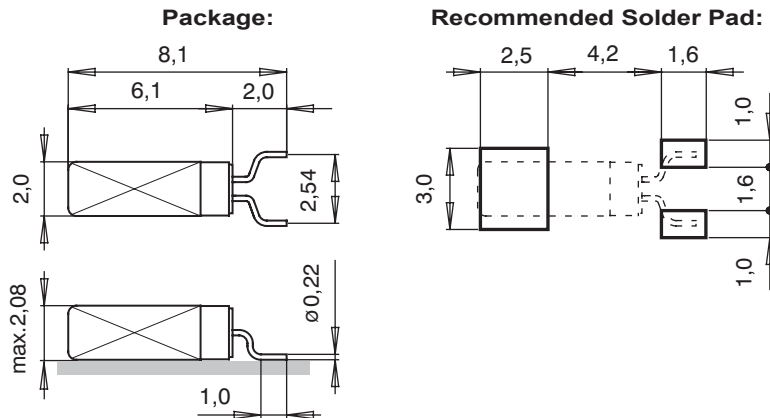


# MS1V-T1K

Tuning Fork Crystal 30 kHz – 200 kHz



## DIMENSIONS



All dimensions in mm typical

**Small SMT package**  
**Package height 2.08 mm max.**  
**Formed leads for SMD mounting**  
**Industrial temp. range**  
**Very price competitive**  
**High stability**  
**Low aging**  
**Low power consumption**  
**High shock and vibration resistance**

## DESCRIPTION:

The MS1V-T1K is a square-bodied 2.0 x 8.1 x 2.0 mm metal-can package with formed leads, intended for surface mounting and reflow soldering. Within the package is a high-quality tuning fork quartz crystal resonator, manufactured with a precision high-volume photolithographic process and operating in the fundamental mode.

Due to highly automated, large-volume production, the MS1V-T1K is very price competitive and ideal for any consumer and industrial applications.

For pick-and-place equipment, the crystals are supplied in 16 mm tape:  
 7" (178 mm) reel with 2'000 crystals  
 13" (330 mm) reel with 8'000 crystals

## ELECTRICAL CHARACTERISTICS AT 25°C:

Frequency Range	$F_L$	30–200	kHz
Load capacitance <sup>1)</sup>	$C_L$	7.0 / 9.0 / 12.5	pF
Frequency tolerance <sup>2)</sup>	$\Delta F/F$	+/-20	ppm
	$\Delta F/F$	+/-100	ppm
Drive level max.	P	1.0	$\mu W$
Insulation resistance min.	$R_i$	500	M $\Omega$
Aging first year max.	$\Delta F/F_0$	+/-3	ppm

Frequency Example <sup>3)</sup>	$F_L$	32.000	32.768	76.800	kHz
Series resistance typ./max.	$R_s$	45 / 60	45 / 60	18 / 30	k $\Omega$
Motional capacitance typ.	$C_1$	2.3	2.1	1.35	fF
Static capacitance typ.	$C_0$	0.9	0.9	0.9	pF
Turnover temperature	$T_0$	25 +/-5	25 +/-5	22 +/-5	$^{\circ}C$
Frequency vs. temperature	$\Delta F/F_0$	$-0.035 \text{ ppm}/^{\circ}C^2 (T - T_0)^2 \text{ +/-} 10\%$			ppm

1) For standard and other load capacitances consult factory.

2) Tighter and wider frequency tolerances on request.

3) Values for other frequencies consult factory.

**STANDARD FREQUENCIES:**

Frequency kHz				
32.000	32.768	38.400	40.000	60.000
75.000	76.800	77.500		
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-T1N	Can: Au flashed Leads: Straight leads Au flashed	For trough-hole mounting 260°C / 20 sec. max
MS1V-T1K	Can: Au flashed Leads: Formed leads Au flashed	For SMD mounting Reflow soldering 260°C / 20 sec. max

**PRODUCT DESCRIPTION AND ORDERING INFORMATION:**

**MS1V-T1K**    32.768kHz    12.5pF    +/-20ppm    TA    QC

Frequency  $f_0$   
 $C_L$  Load Capacitance  
 7.0 pF  
 9.0 pF  
 12.5 pF  
Frequency tolerance  
 +/- 20 ppm  
 +/- 100 ppm

Temperature Range  
 TA = -40 to 85°C (Standard)

Optional:  
 if not defined,  
 'Standard' will apply

Qualification  
 QC = Commercial (Standard)

A unique part number will be generated for each product specification, i.e:  
 20xxxx-ML02                      2'000 pcs (in 16mm tape on 7" reel)  
 20xxxx-PL08                      8'000 pcs (in 16mm tape on 13" reel)  
 Please contact us.

All specifications subject to change without notice.



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