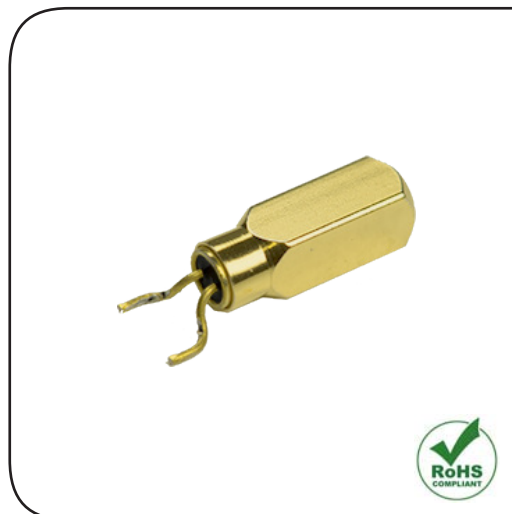


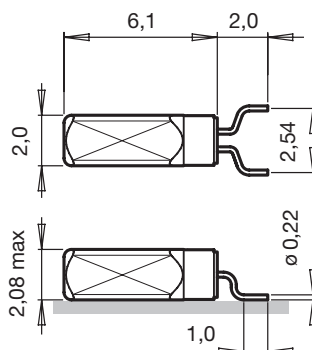
# MS1V-T1K

**Tuning Fork Crystal 32 kHz – 100 kHz**

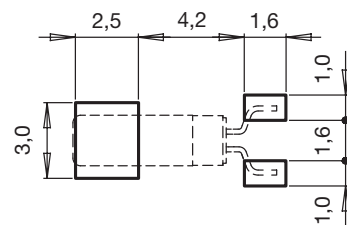


## DIMENSIONS

### Package:



### Recommended Solder Pad:



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>	$\Delta F/F$	$\pm 20$	ppm
	$\Delta F/F$	$\pm 100$	ppm
Series resistance typ./max.	$R_S$	45 / 60	k $\Omega$
Motional capacitance typ.	$C_1$	2.25	fF
Static capacitance typ.	$C_0$	0.9	pF
Drive level max.	P	1.0	$\mu$ W
Insulation resistance min.	$R_i$	500	M $\Omega$
Aging first year max.	$\Delta F/F$	$\pm 3$	ppm
Turnover temperature	$T_0$	25 $\pm$ 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

<b>MS1V-T1K</b>		<b>32.768 kHz</b>	<b>12.5 pF</b>	<b>±20 ppm</b>	<b>TA</b>	<b>QC</b>	<b>Au</b>
<b>Square metal package</b> <b>MS1V</b> = 2.0 x 2.0 x 6.1 mm		<b>Frequency <math>F_L</math></b>	<b>Load capacitance <math>C_L</math></b> 6.0 pF 7.0 pF 9.0 pF 12.5 pF Other $C_L$ on request	<b>Frequency tolerance</b> ±20 ppm ±100 ppm Tighter and wider freq. tolerances on request	<b>Temperature range</b> <b>TA</b> = -40 to +85°C	<b>Qualification</b> <b>QC</b> = Commercial Grade	<b>Au flashed can</b>
<b>SMT Package</b>							
<b>Au flashed leads</b>							
<b>Package lead form</b> <b>K</b> = SMD spacing 2.54 mm <b>N</b> = Straight leads							
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.