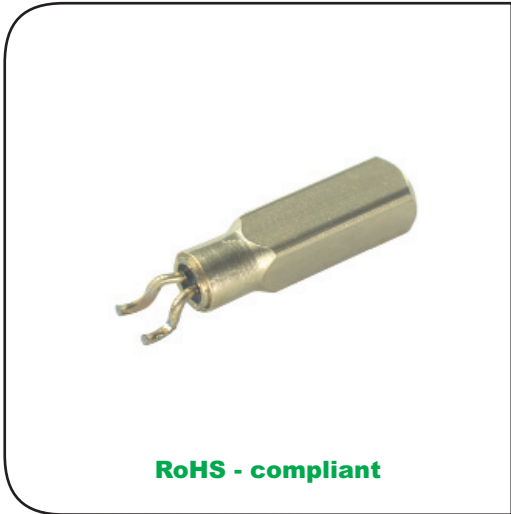
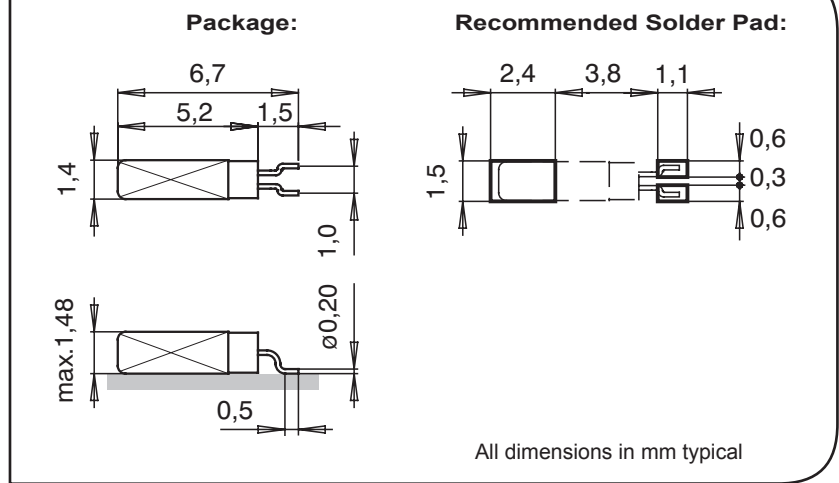


# MS3V-T1R

Tuning Fork Crystal 30 kHz – 200 kHz



## DIMENSIONS



**Miniature SMT package**  
**Package height 1.48 mm max.**  
**Compatible solder pad layout with plastic molded crystal packages**  
**Industrial temp. range**  
**Very price competitive**  
**Low aging**  
**Low power consumption**  
**High shock and vibration resistance**

## DESCRIPTION:

The MS3V-T1R is a miniature square-bodied 1.4 x 1.4 x 5 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 MS3V-T1R 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: 13" (330 mm) reel with 9'000 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
	$\Delta F/F$	+/-30	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.	$\Delta F/F$	+/-3	ppm

Frequency Example <sup>3)</sup>	$F_L$	32.768	75.000	76.800	kHz
Series resistance typ./max.	$R_S$	50 / 65	19 / 30	18 / 30	k $\Omega$
Motional capacitance typ.	$C_1$	2.1	1.45	1.35	fF
Static capacitance typ.	$C_0$	0.9	0.9	0.9	pF
Turnover temperature	$T_0$	25 +/-5	22 +/-5	22 +/-5	$^{\circ}C$
Frequency vs. temperature	$\Delta F/F_0$	$-0.035 \text{ ppm}/^{\circ}C^2 (T - T_0)^2$			+/-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				
32.768	38.400	75.000	76.800	77.500
Other frequencies on request				

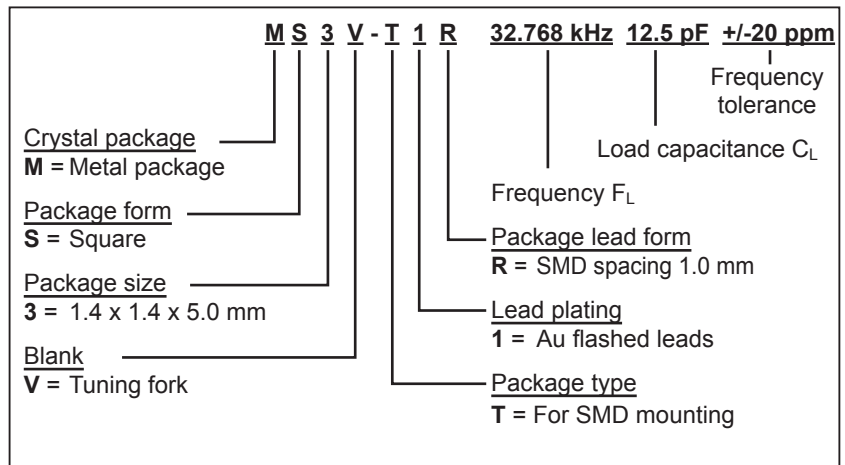
**ENVIRONMENTAL CHARACTERISTICS:**

		Conditions	Max. Dev.
Storage temp. range		-55 to +85°C	
Operating temp. range		-40 to +85°C	
Shock resistance	$\Delta F/F$	5000 g, 0.3 ms, 1/2 sine	+/-5 ppm
Vibration resistance	$\Delta F/F$	20 g / 10-2000 Hz	+/-5 ppm

**TERMINATIONS AND PROCESSING:**

Type	Termination	Processing
MS3V-T1R	Can: Au flashed Leads: Formed leads Au flashed	For SMD mounting Reflow soldering 260°C / 20 sec. max

**PART NUMBER/  
ORDERING INFORMATION  
EXAMPLE:**



All specifications subject to change without notice. 04.09



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