

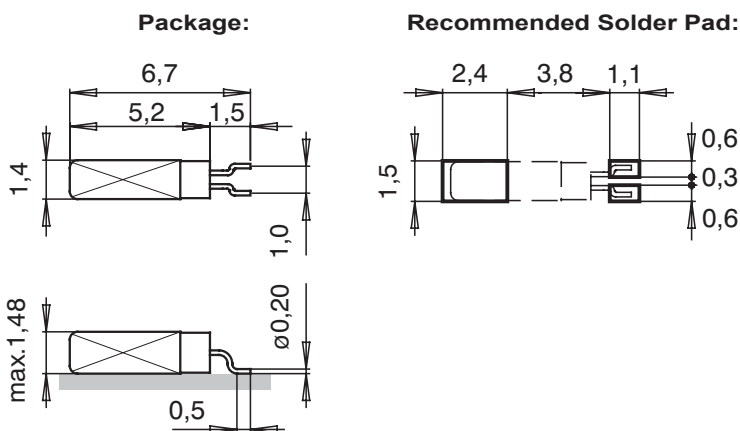
MS3V-T1R

Tuning Fork Crystal 30 kHz – 200 kHz



RoHS - compliant

DIMENSIONS



All dimensions in mm typical

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 ¹⁾	C_L	7.0 / 9.0 / 12.5	pF
Frequency tolerance ²⁾	$\Delta F/F$	+/-20	ppm
	$\Delta F/F$	+/-30	ppm
	$\Delta F/F$	+/-100	ppm
Drive level max.	P	1.0	μW
Insulation resistance min.	R_i	500	MΩ
Aging first year max.	$\Delta F/F$	+/-3	ppm

Frequency Example ³⁾	F_L	32.768	75.000	76.800	kHz
Series resistance typ./max.	R_S	50 / 65	19 / 30	18 / 30	kΩ
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	°C
Frequency vs. temperature	$\Delta F/F_0$	$-0.035 \text{ ppm}/^\circ\text{C}^2 (T - T_0)^2 \text{ +/-10\%}$			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				
32.768	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:

<u>Crystal package</u>	<u>M</u>	<u>S</u>	<u>3</u>	<u>V</u>	<u>-</u>	<u>T</u>	<u>1</u>	<u>R</u>	<u>32.768 kHz</u>	<u>12.5 pF</u>	<u>+/-20 ppm</u>
<u>M</u> = Metal package											Frequency tolerance
<u>Package form</u>											Load capacitance C_L
<u>S</u> = Square											Frequency F_L
<u>Package size</u>											<u>Package lead form</u>
<u>3</u> = 1.4 x 1.4 x 5.0 mm											<u>R</u> = SMD spacing 1.0 mm
<u>Blank</u>											<u>Lead plating</u>
<u>V</u> = Tuning fork											<u>1</u> = Au flashed leads
											<u>Package type</u>
											<u>T</u> = For SMD mounting

All specifications subject to change without notice. 04.09



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