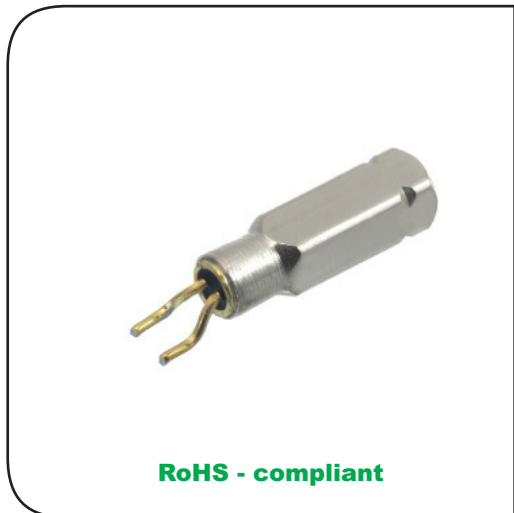
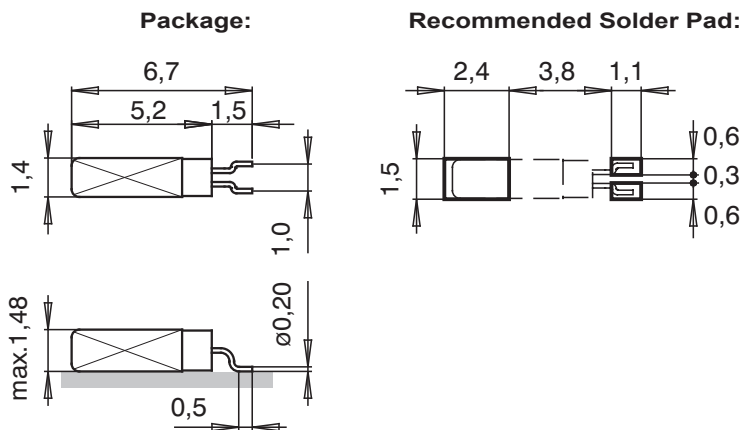


# MS3V-T1R

**Tuning Fork Crystal 30 kHz – 200 kHz**



## 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 temperature 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 6.7 x 1.4 mm metal 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:  
 7" (178 mm) reel with 2'000 crystals  
 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
	$\Delta F/F$	+/-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 ppm/ $^{\circ}C^2$ (T - $T_0$ ) <sup>2</sup> +/-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 temperature range		-55 to +85°C	
TA Operating temperature 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: Pd plated Leads: Formed leads Au flashed	For SMD mounting Reflow soldering 260°C / 20 sec. max

**PRODUCT DESCRIPTION AND  
ORDERING INFORMATION:**

<b>MS3V-T1R</b>	<b>32.768kHz</b>	<b>12.5pF</b>	<b>+/-20ppm</b>	<b>TA</b>	<b>QC</b>
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Frequency F<sub>1</sub>  
7.0 pF  
9.0 pF  
12.5 pF

C<sub>L</sub> Load Capacitance

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-PL09                      9'000 pcs (in 16mm tape on 13" reel)  
 Please contact us.

All specifications subject to change without notice.



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