



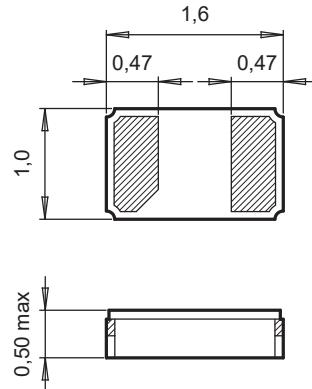
# CM9V-T1A

## Tuning Fork Crystal 32.768 kHz

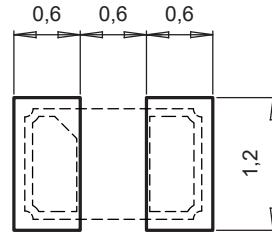


### DIMENSIONS

#### Package:



#### Recommended Solder Pad:



All dimensions in mm typical

### APPLICATIONS

IoT  
Metering  
Industrial  
Automotive  
Health Care  
Wearables, Portables

### DESCRIPTION

The CM9V-T1A is a low frequency SMD Quartz Crystal Unit that incorporates a tuning fork Quartz Crystal Resonator. It operates under vacuum in a hermetically sealed ceramic package with metal lid.

### FEATURES

Ultra small size (1.6 × 1.0 × 0.50 mm).  
Outstanding hermetic sealing with gold-tin preform.  
High stability and low aging guaranteed by hermetic sealing.  
Available for extended operating temperature range.  
Lightweight (2.5 mg).  
High shock and vibration resistant.  
100% Pb-free, RoHS-compliant.  
Automotive qualification according to AEC-Q200 available.

### ELECTRICAL CHARACTERISTICS AT 25°C

Standard Frequency <sup>1)</sup>	F <sub>L</sub>	32.768	kHz
Load capacitance <sup>2)</sup>	C <sub>L</sub>	4.0 / 6.0 / 7.0 / 9.0 / 12.5	pF
Frequency tolerance <sup>3)</sup>	ΔF/F	±20	ppm
	ΔF/F	±100	ppm
Series resistance typ./max.	R <sub>S</sub>	65 / 80	kΩ
Motional capacitance typ.	C <sub>1</sub>	6.2	fF
Static capacitance typ.	C <sub>0</sub>	1.4	pF
Drive level max.	P	0.5	μW
Insulation resistance min.	R <sub>i</sub>	500	MΩ
Aging first year max.	ΔF/F	±3	ppm
Turnover temperature	T <sub>0</sub>	25 ±5	°C
Frequency vs. temperature	ΔF/F <sub>0</sub>	-0.035 ppm/°C <sup>2</sup> (T - T <sub>0</sub> ) <sup>2</sup> ±10%	ppm

1) Other frequencies on request.

2) Other load capacitances on request.

3) Tighter frequency tolerances on request.

## STANDARD FREQUENCIES

Frequency
32.768 kHz
Other frequencies on request

## ENVIRONMENTAL CHARACTERISTICS

		Conditions	Max. Dev.
Storage temperature range		-55 to +125°C	
TA Operating temperature range		-40 to +85°C	
TB Extended oper. temp. range		-40 to +125°C	
TC Extended oper. temp. range		-55 to +125°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
CM9V-T1A	Au flashed pads	IPC/JEDEC J-STD-020C 260°C / 20 - 40 s

## ORDERING INFORMATION

C M 9 V - T 1 A	32.768 kHz	12.5 pF	±20 ppm	TA	QC
Ceramic package			Frequency $F_L$		
Metal lid			Load capacitance $C_L$		
Package size			4.0 pF 6.0 pF 7.0 pF 9.0 pF 12.5 pF Other $C_L$ on request		
9 = 1.6 x 1.0 x 0.50 mm					
Tuning fork			Frequency tolerance		
SMD Package			±20 ppm ±100 ppm Tighter freq. tolerances on request		
Au flashed pads					
2 pads					
			Temperature range		
			TA = -40 to +85°C (Standard) TB = -40 to +125°C TC = -55 to +125°C		
			Qualification		
			QC = Commercial Grade (Standard) QA = Automotive Grade AEC-Q200		
A unique part number will be generated for each product specification, i.e:					
20xxxx-MC01	1'000 pcs (in 8 mm tape on 7" reel)				
20xxxx-MC03	3'000 pcs (in 8 mm tape on 7" reel)				

All specifications subject to change without notice.



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