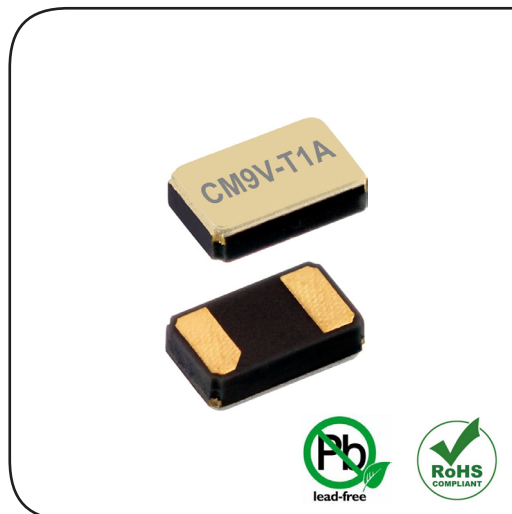
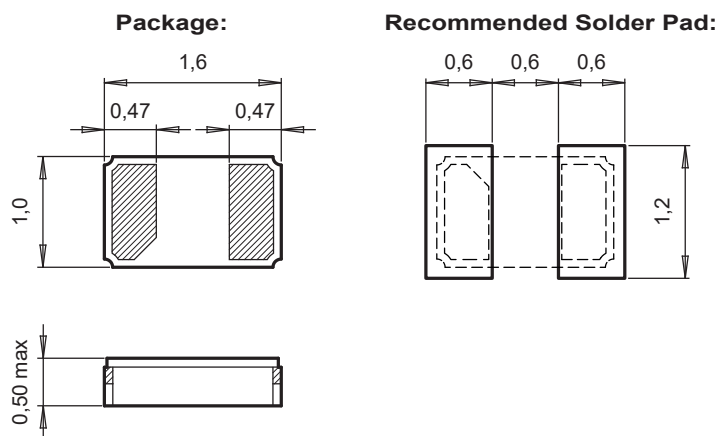


CM9V-T1A

Tuning Fork Crystal 32.768 kHz



DIMENSIONS



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 ¹⁾	F_L	32.768	kHz
Load capacitance ²⁾	C_L	4.0 / 6.0 / 7.0 / 9.0 / 12.5	pF
Frequency tolerance ³⁾	$\Delta F/F$	±20	ppm
	$\Delta F/F$	±100	ppm
Series resistance typ./max.	R_S	65 / 80	kΩ
Motional capacitance typ.	C_1	6.2	fF
Static capacitance typ.	C_0	1.4	pF
Drive level max.	P	0.5	μW
Insulation resistance min.	R_i	500	MΩ
Aging first year max.	$\Delta F/F$	±3	ppm
Turnover temperature	T_0	25 ±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 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				
9 = 1.6 x 1.0 x 0.50 mm									6.0 pF				
Tuning fork									7.0 pF				
SMD Package									9.0 pF				
Au flashed pads									12.5 pF				
2 pads									Other C_L on request				
									Frequency tolerance				
									±20 ppm				
									±100 ppm				
									Tighter freq. tolerances on request				
									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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