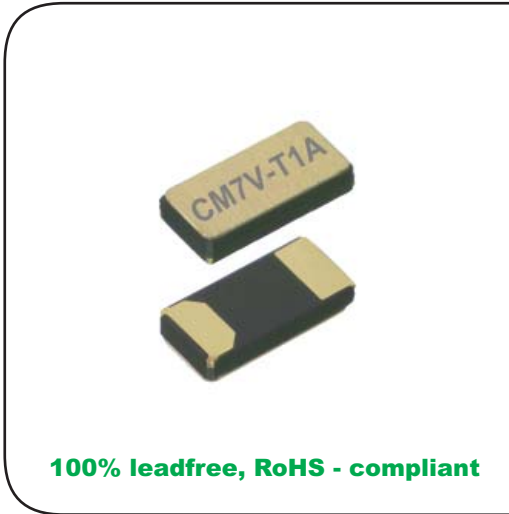
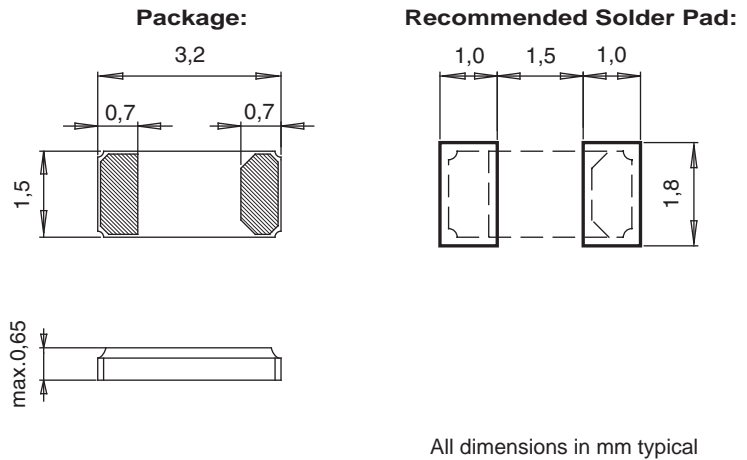


# CM7V-T1A

## Tuning Fork Crystal 32.768 kHz Low ESR



### DIMENSIONS



Optimized Low ESR design for critical oscillator-circuitries  
 Miniature SMT ceramic package with metal lid  
 Low package height 0.65 mm max.  
 SMD-package in Tape and Reel  
 Ind. and Ext. temperature ranges  
 AEC-Q200 automotive compliant  
 High stability, Low aging  
 Low power consumption  
 High shock and vibration resistance

### DESCRIPTION:

This SMD ceramic package with metal lid has been specially designed for miniature industrial, telecom and portable applications. This part is specially designed for Low ESR to support critical oscillator-circuitries and is available for extended operating temperature range and is compliant with the AEC-Q200 quality standards for automotive applications. A special crystal manufacturing process is used to achieve low ESR in combination with miniaturized blank size.

For pick-and-place equipment, the parts are available in 12 mm tape:  
 7" (178 mm) reel with 1'000 crystals  
 7" (178 mm) reel with 3'000 crystals  
 13" (330 mm) reel with 14'000 crystals

### ELECTRICAL CHARACTERISTICS AT 25°C:

Nominal Frequency	<sup>1)</sup> F <sub>L</sub>	32.768	kHz
Load capacitance	<sup>2)</sup> C <sub>L</sub>	7.0 / 9.0 / 12.5	pF
Frequency tolerance	<sup>3)</sup> ΔF/F	+/-20	ppm
		+/-100	ppm
Series resistance typ./max.	R <sub>S</sub>	40 / 50	kΩ
Motional capacitance typ.	C <sub>1</sub>	4.5	fF
Static capacitance typ.	C <sub>0</sub>	1.2	pF
Drive level max.	P	1.0	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 and wider frequency tolerances on request.

**STANDARD FREQUENCIES:**

<b>Frequency kHz</b>
32.768
Other frequencies on request

**ENVIRONMENTAL  
CHARACTERISTICS:**

		<b>Conditions</b>	<b>Max. Dev.</b>
Storage temp. 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:**

<b>Type</b>	<b>Termination</b>	<b>Processing</b>
CM7V-T1A	For SMD mounting Au plated pads	Reflow soldering 260°C / 20 s max.

**PRODUCT DESCRIPTION AND  
ORDERING INFORMATION:**

**CM7V-T1A** Low ESR **32.768kHz** **12.5pF** **+/-20ppm** **TA** **QC**

**Frequency  $F_0$**  \_\_\_\_\_

**$C_L$  Load Capacitance** \_\_\_\_\_

7.0 pF  
9.0 pF  
12.5 pF

**Frequency tolerance** \_\_\_\_\_

+/- 20 ppm  
+/- 100 ppm

**Temperature Range** \_\_\_\_\_

TA = -40 to 85°C (Standard)  
TB = -40 to +125°C  
TC = -55 to +125°C

**Optional:**  
if not defined,  
,Standard' will apply

**Qualification** \_\_\_\_\_

QC = Commercial (Standard)  
QA = Automotive AEC-Q200

A unique part number will be generated for each product specification, i.e:

20xxxx-MG01	1'000 pcs	(in 12mm tape on 7" reel)
20xxxx-MG03	3'000 pcs	(in 12mm tape on 7" reel)
20xxxx-PG14	14'000 pcs	(in 12mm tape on 13" reel)

Please contact us.

All specifications subject to change without notice.



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