

# 32.768KHz SMD Low Profile Crystal

ABS09

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4.1 x 1.5 x 0.9 mm  
RoHS/RoHS II Compliant  
MSL Level = N/A

## Features

- Low frequency in small size SMD
- 0.9mm height ideal for high density circuit boards
- Ceramic package offers excellent environmental & heat resistance
- -40°C to +85°C for industrial applications

## Applications

- Wide range in communication & measuring equipment
- Commercial & Industrial applications
- Wireless communications

## Key Electrical Specifications

Parameter	Specification
Nominal frequency:	32.768 kHz
Operating temperature:	- 40° C to + 85°C
Turn-over temperature:	+25° C ± 5° C
Storage temperature:	- 55° C to + 125°C
Frequency tolerance:	± 20 ppm max.
Temperature coefficient:	- 0.034±0.006 ppm/T <sup>2</sup>
Equivalent series resistance:	70 kohms max.
Load capacitance CL:	12.5 pF (see options)
Drive level:	1.0 µW max.
Aging @ 25° C first year:	± 5 ppm max.
Insulation resistance:	500Mohms with 100Vdc ± 15V
Shunt capacitance C0:	1.0pF typ.
Motional capacitance C1:	2.0fF typ.

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## OPTIONS AND PART IDENTIFICATION (Left blank if standard)

ABS09-32.768kHz-□-□-□

Load Capacitance (*)	
Blank	12.5pF
9	9pF
7	7pF

(\*) Contact ABRACON for  
non-standard load capacitance

Freq. Tolerance	
1	± 10 ppm
4	± 30 ppm

Packaging	
Blank	Bulk
T	Tape and Reel

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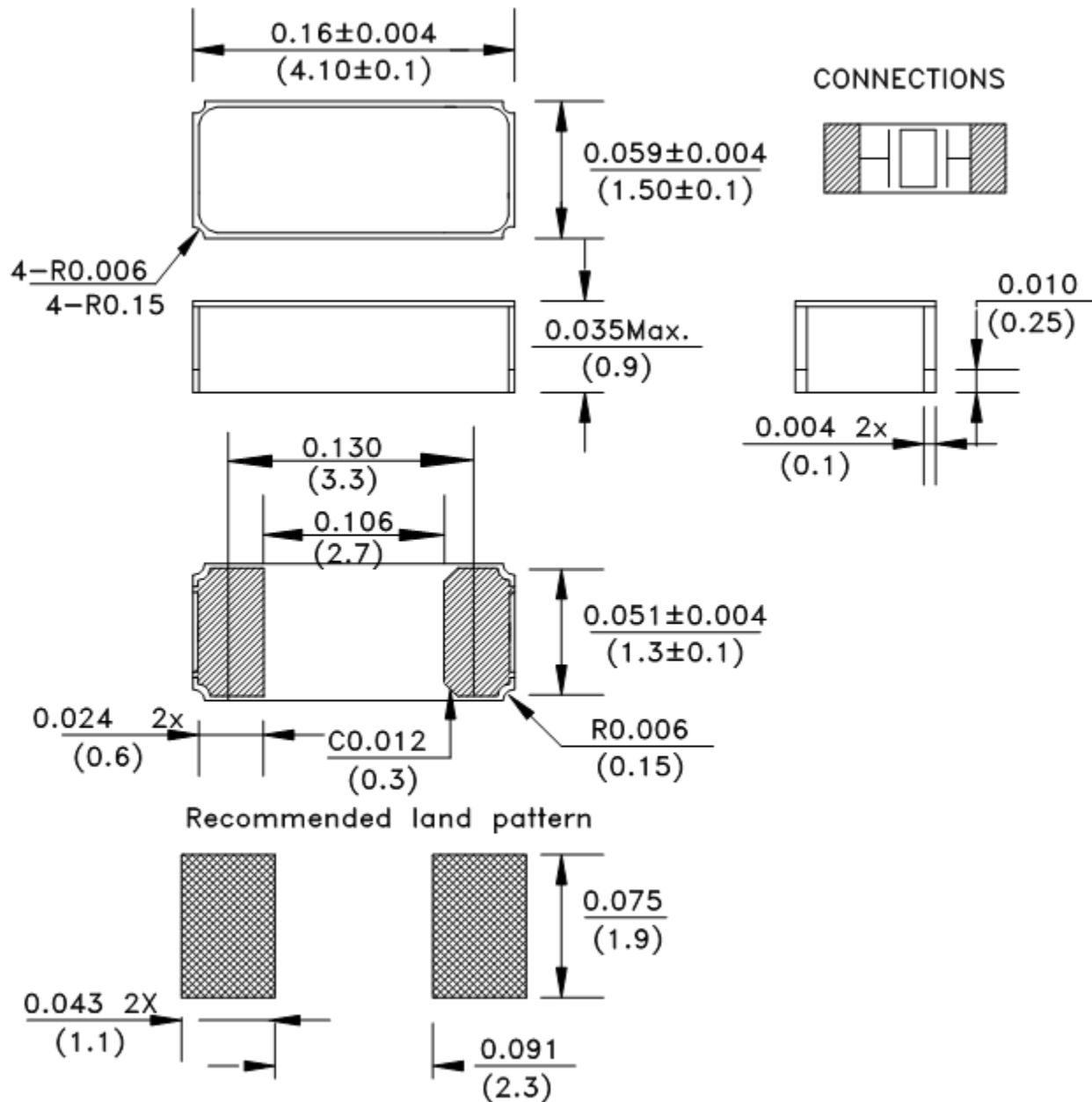
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## MECHANICAL DIMENSIONS



Dimensions: inches (mm)

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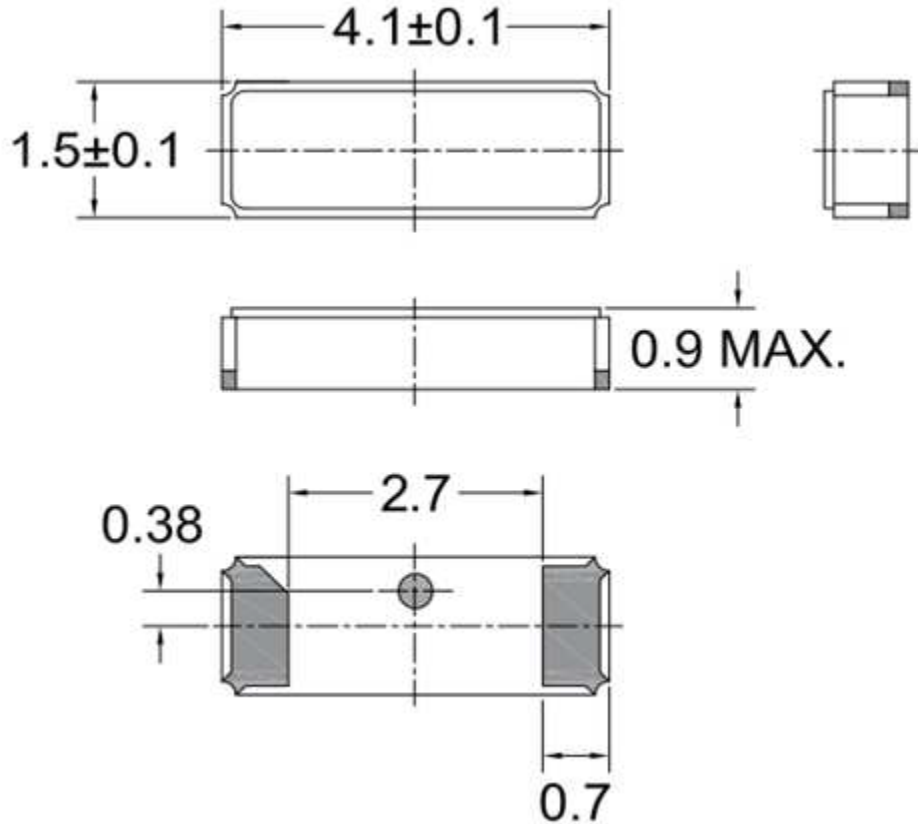
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## Alternative Packaging 1:



Dimensions: mm

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## Reflow Profile [JEDEC J-STD-020]

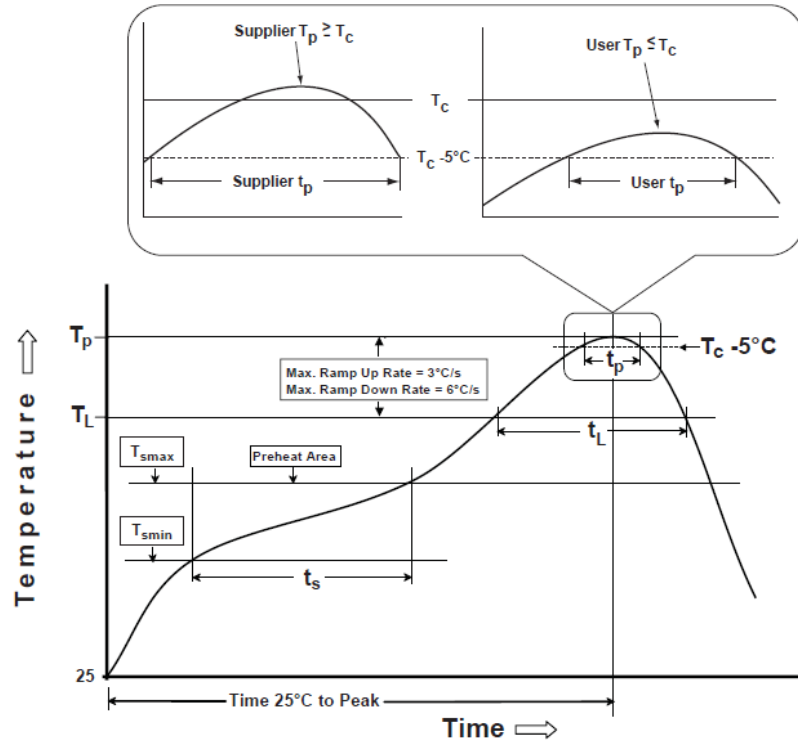


Table 1

### SnPb Eutectic Process

#### Classification Temperatures ( $T_C$ )

Package Thickness	Volume mm <sup>3</sup> <350	Volume mm <sup>3</sup> ≥350
<2.5 mm	235 °C	220 °C
≥2.5 mm	220 °C	220 °C

Table 2

### Pb-Free Process

#### Classification Temperatures ( $T_C$ )

Package Thickness	Volume mm <sup>3</sup> <350	Volume mm <sup>3</sup> 350-2000	Volume mm <sup>3</sup> >2000
<1.6 mm	260 °C	260 °C	260 °C
1.6 mm - 2.5 mm	260 °C	250 °C	245 °C
>2.5 mm	250 °C	245 °C	245 °C

Profile Feature	Sn-Pb Eutectic Assembly	Pb-Free Assembly
Preheat / soak		
Temperature minimum ( $T_{smin}$ )	100°C	150°C
Temperature maximum ( $T_{smax}$ )	150°C	200°C
Time ( $T_{smin}$ to $T_{smax}$ ) ( $t_s$ )	60 - 120 sec.	60 - 120 sec.
Average ramp-up rate ( $T_{smax}$ to $T_p$ )	3°C/sec. max	3°C/sec. max
Liquidous temperature ( $T_L$ )	183°C	217°C
Time at liquidous ( $t_L$ )	60 - 150 sec.	60 - 150 sec.
Peak package body temperature ( $T_p$ )*	see Table 1	see Table 2
Time ( $t_p$ )** within 5°C of the specified classification temperature ( $T_C$ )	20 sec.	30 sec.
Ramp-down rate ( $T_p$ to $T_{smax}$ )	6°C/sec. max	6°C/sec. max
Time 25°C to peak temperature	6 min. max	8 min. max
Reflow cycles	2 max	2 max

\*Tolerance for peak profile temperature ( $T_p$ ) is defined as a supplier minimum and a user maximum.

\*\*Tolerance for time at peak profile temperature ( $t_p$ ) is defined as supplier minimum and a user maximum.

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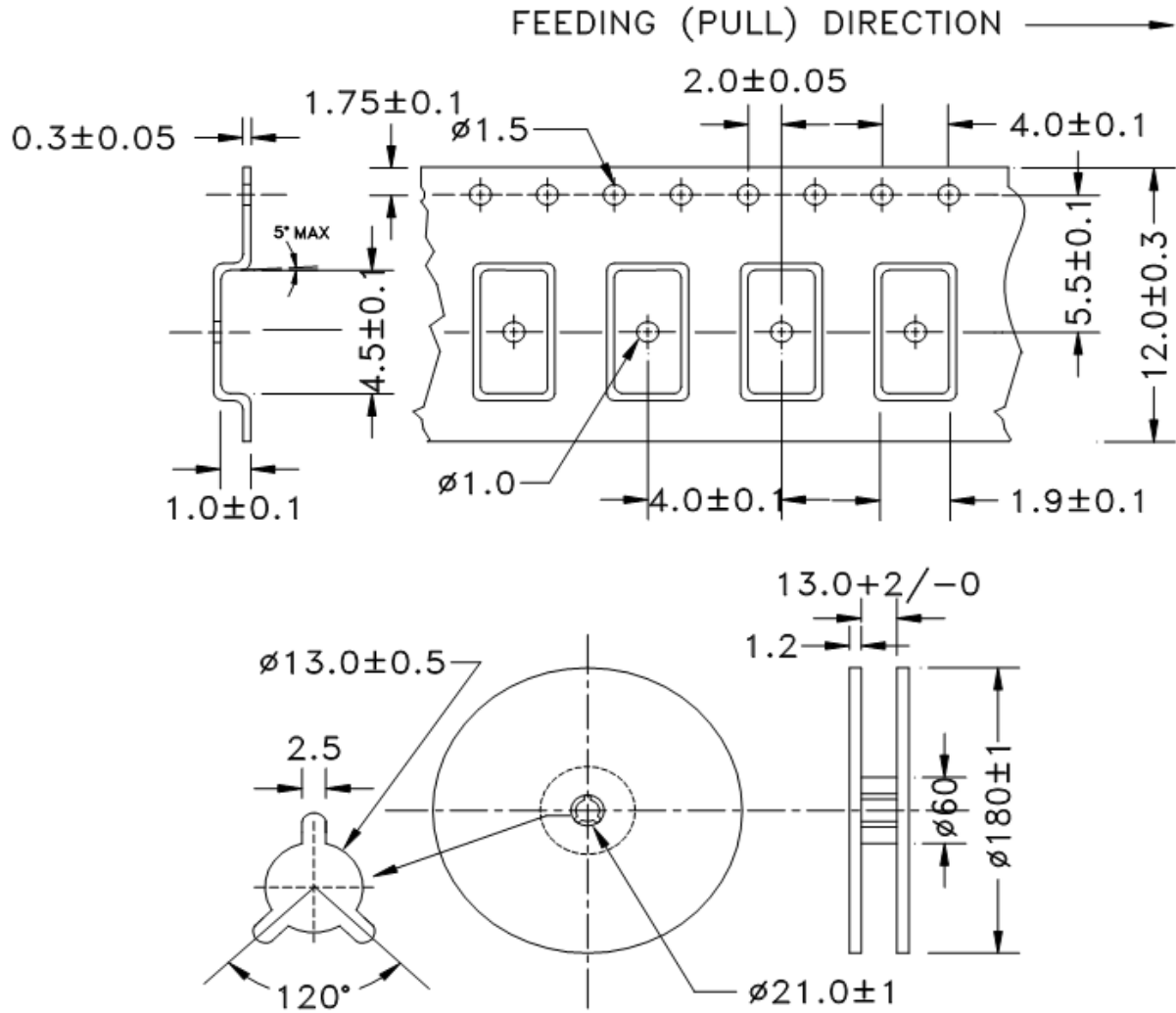


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## PACKAGING

T= tape and reel (3,000pcs/reel)



Dimension : mm

**ATTENTION:** Abracon LLC's products are COTS – Commercial-Off-The-Shelf products; suitable for Commercial, Industrial and, where designated, Automotive Applications. Abracon's products are not specifically designed for Military, Aviation, Aerospace, Life-dependent Medical applications or any application requiring high reliability where component failure could result in loss of life and/or property. For applications requiring high reliability and/or presenting an extreme operating environment, written consent and authorization from Abracon LLC is required. Please contact Abracon LLC for more information.



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