

# 32.768kHz SMD Low ESR Crystal

ABS07-LR

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



## Features

- Guaranteed ESR of 50kΩ maximum for low power designs
- 0.9mm height ideal for high density circuit boards
- Seam sealed ceramic package offers excellent environmental & heat resistance
- Extended operating temperature of -40°C to +85°C for industrial applications

## Applications

- Power sensitive designs requiring low ESR crystal
- Communication & measurement equipment
- Commercial, consumer & industrial applications
- Wireless communications

## Key Electrical Specifications

Parameters	Min.	Typ.	Max.	Units	Notes
Frequency	32.768			kHz	
Operation Mode	Flexural Mode (Tuning Fork)			°C	
Operating Temperature	-40		+85	°C	
Storage Temperature	-55		+125	°C	
Frequency Tolerance @+25°C	-20		+20	ppm	See options
Temperature Coefficient:	-0.040	-0.034	-0.028	ppm/°C <sup>2</sup>	
Turn-over temperature:	+20	+25	+30	°C	
Equivalent series resistance @+25°C			50	kΩ	
Shunt capacitance (C0)		1.3		pF	
Load capacitance (CL)		6		pF	
Drive Level		0.1	0.5	μW	
Q value		25000			
Aging@25°C±3°C	-3		3	ppm	First year
Insulation Resistance	500			MΩ	@ 100Vdc ± 15V

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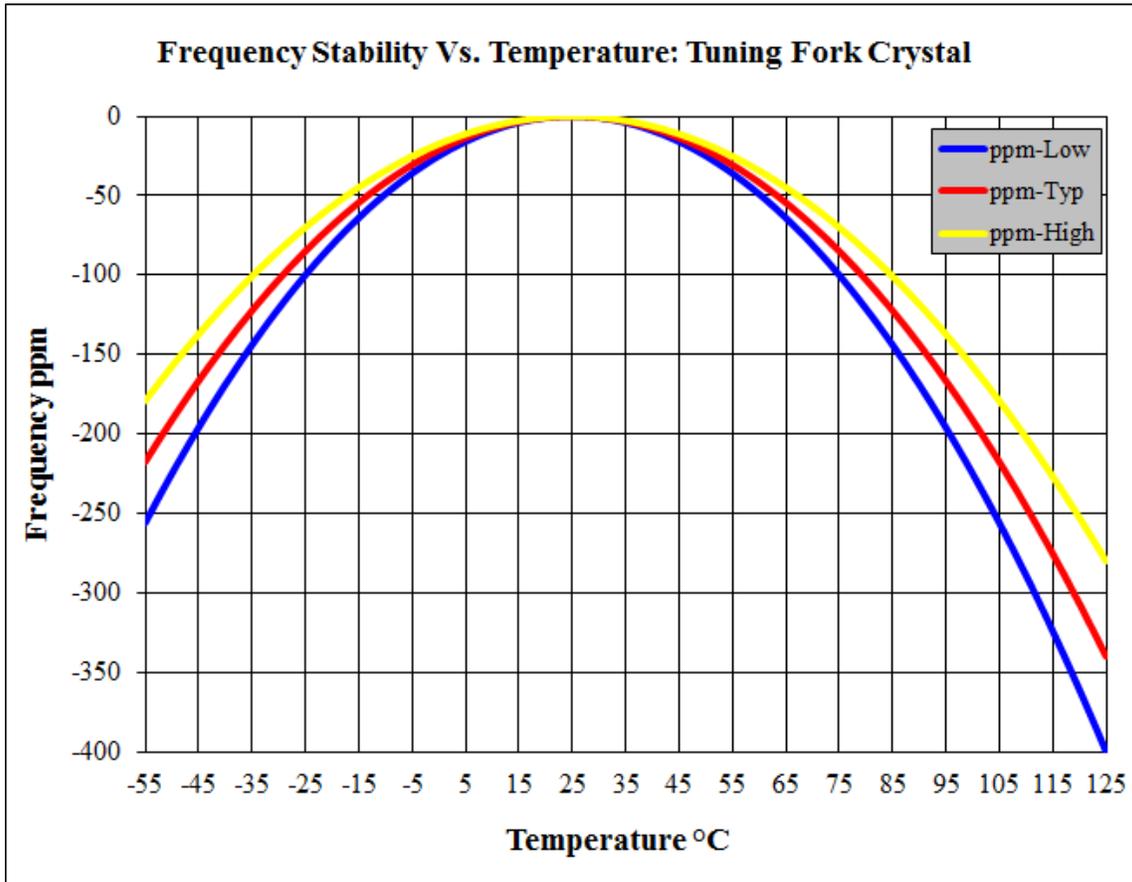
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## Typical Frequency vs. Temperature Characteristics



## Options and Part Identification (left blank if standard)

ABS07-LR-32.768 kHz-6- -

Freq. Tolerance
Blank: ±20ppm
1: ±10ppm

Packaging
Blank: Bulk
T: Tape & Reel (3000pcs/reel)



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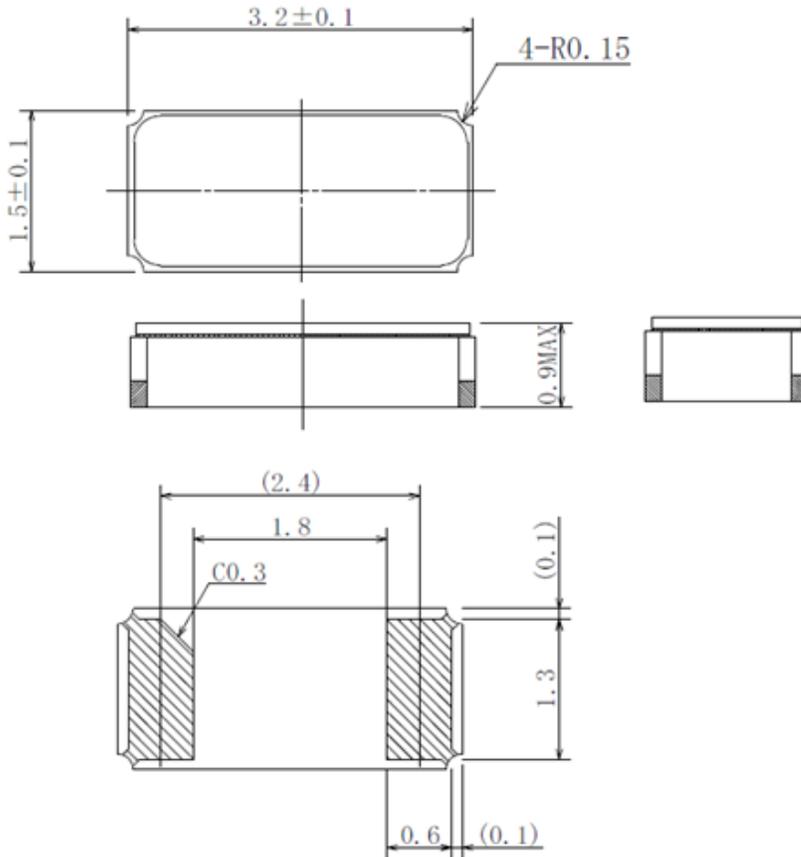
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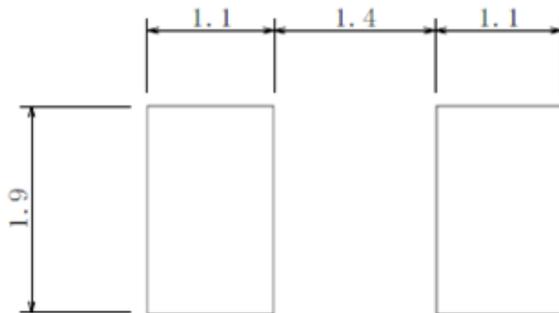
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## Mechanical Dimensions



### Recommended Land Pattern



Dimensions: mm

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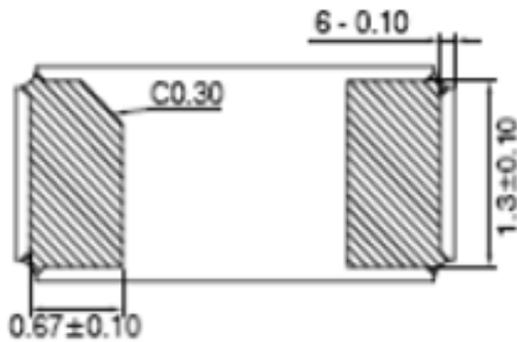
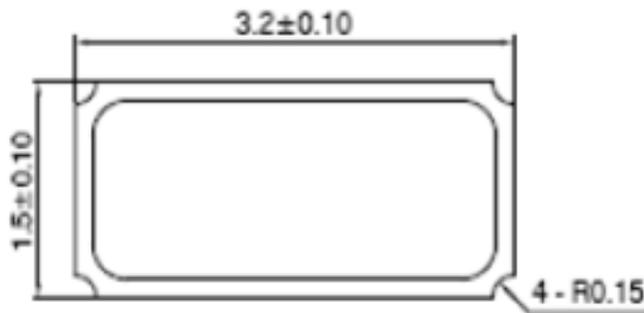
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## Alternative Mechanical Dimensions #1:



**Dimensions: mm**

Sealing Method = Seam Sealing

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

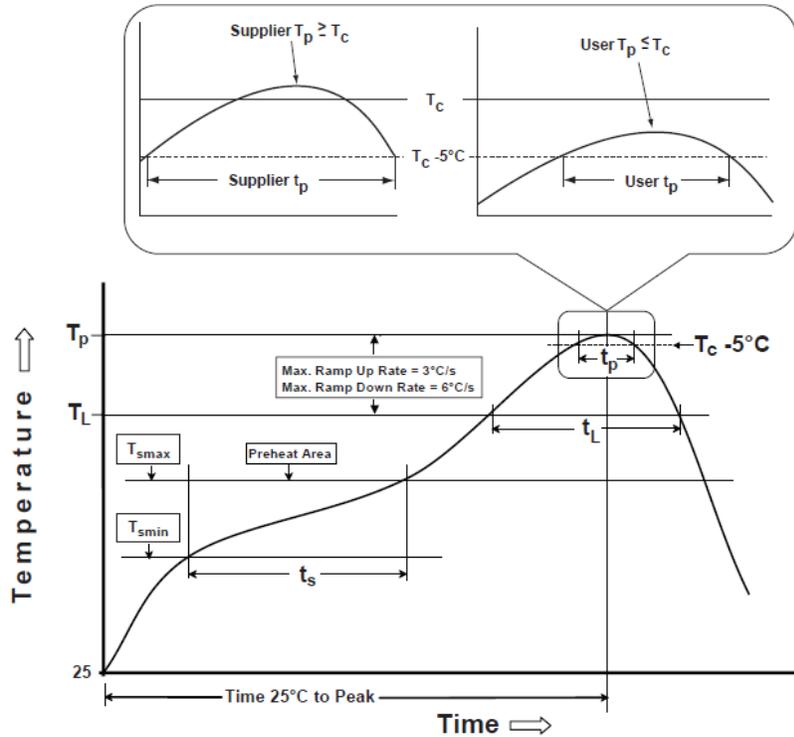


Table 1

### 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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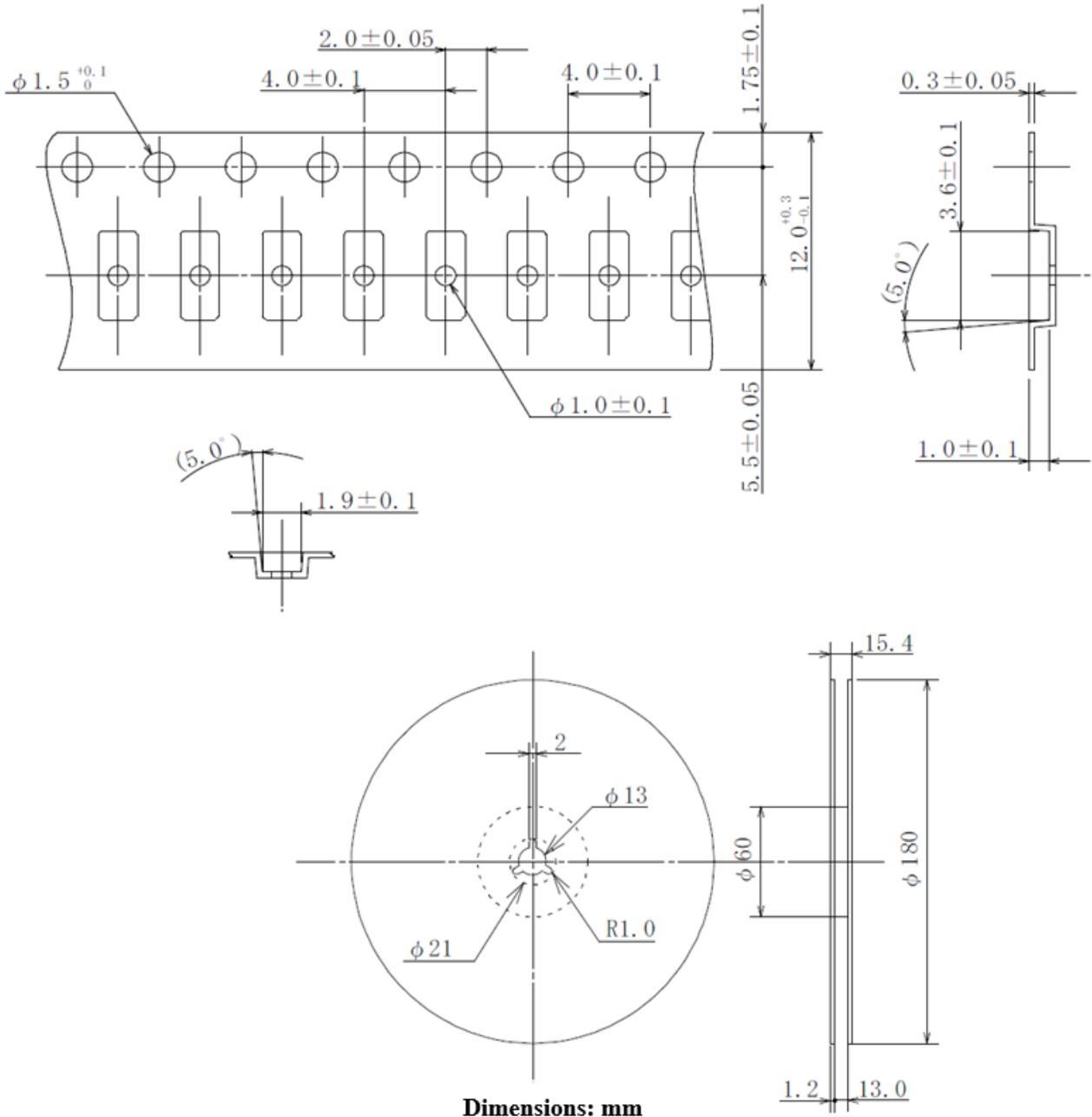


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## Packaging:

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



Dimensions: mm

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