

# Automotive & Industrial Grade 32.768kHz Ceramic Base SMD Crystal

ABS07AIG



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3.2 x 1.5 x 0.9 mm  
**RoHS/RoHS II Compliant**  
 MSL = N/A: Not Applicable

## Features

- AEC-Q200 Qualified
- Automotive Grade 1: -40°C to +125°C
- TS16949 Production Line Certified
- PPAP Available Upon Request
- Hermetically Seam-sealed Ceramic Package
- RoHS/RoHS II Compliant and Pb free

## Applications

- Infotainment Systems
- Keyless Entry & Startup
- GPS & Navigation
- Comfort control
- ADAS (Advanced Driver Assistance Systems)
- Vehicle to Vehicle Communication
- LiDAR (Light Detection and Ranging)
- In-vehicle Networking
- Powertrain & Drive Control
- Power Control & Conversion
- Industrial Control & Automation

## Electrical Specifications

Parameters	Min.	Typ.	Max.	Units	Notes
Frequency	32.768			kHz	
Operation Mode	Flexural Mode (Tuning Fork)				
Operating Temperature	-40		+125	°C	Option "blank"; See options
Storage Temperature	-55		+125	°C	
Frequency Tolerance @ +25°C	-10		+10	ppm	Option "1"; See options
	-20		+20		Option "blank"; See options
Temperature Coefficient	-0.040	-0.036		ppm/T <sup>2</sup>	
Turn-over Temperature	+20	+25	+30	°C	
Frequency stability over operating temperature, relative to in-circuit measured frequency post-reflow	-160		-100	ppm	Over -40°C to +85°C
	-250		-100		Over -40°C to +105°C
	-450		-100		Over -40°C to +125°C
Equivalent series resistance (R1)			45	kΩ	@ +25±3°C
			50		Over -40°C to +85°C
			60		Over -40°C to +105°C
			70		Over -40°C to +125°C
Shunt capacitance (C0)		<1.4		pF	
Motional capacitance (C1)		4.7		fF	
Load capacitance (CL)		12.5		pF	Option "blank"; See options
Drive Level		0.1	0.5	μW	
Q value	10000	30000			
Aging	-3		+3	ppm	@25°C± 3°C First year
Insulation Resistance	500			MΩ	@100 Vdc



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

ABS07AIG-32.768 kHz - ○ - ○ - ○ - ○

Load Capacitance
Blank: 12.5pF
9: 9pF
7: 7pF
6: 6pF
5: 5pF

Operating Temp.Range
Blank: -40 ~ +125°C
D: -40 ~ +85°C
J: -40°C to +105°C

Freq. Tolerance
Blank: ±20ppm
1: ±10ppm
4: ±30ppm

Packaging
Blank: Bulk
T: 3k pcs / reel
T9: 9k pcs / reel

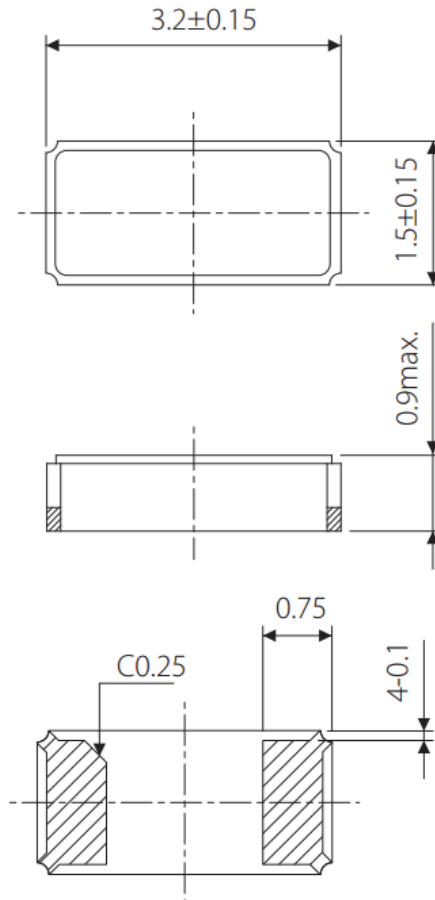


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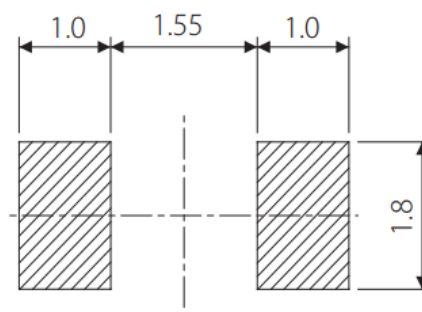


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**Mechanical Dimensions**



**Recommended Land Pattern**



**Dimensions: mm**



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

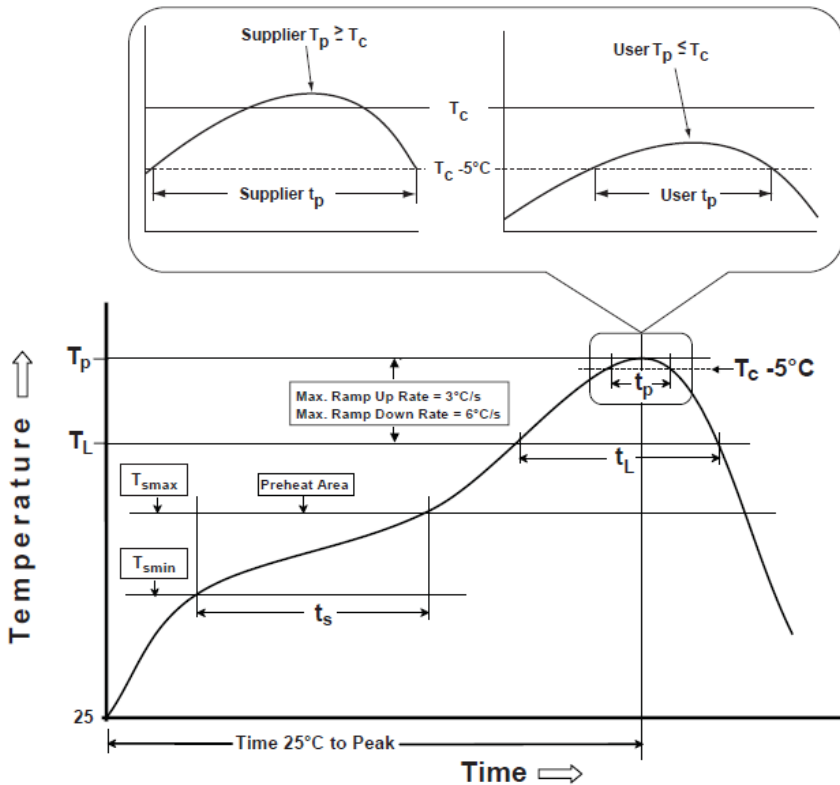


Table 1

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.



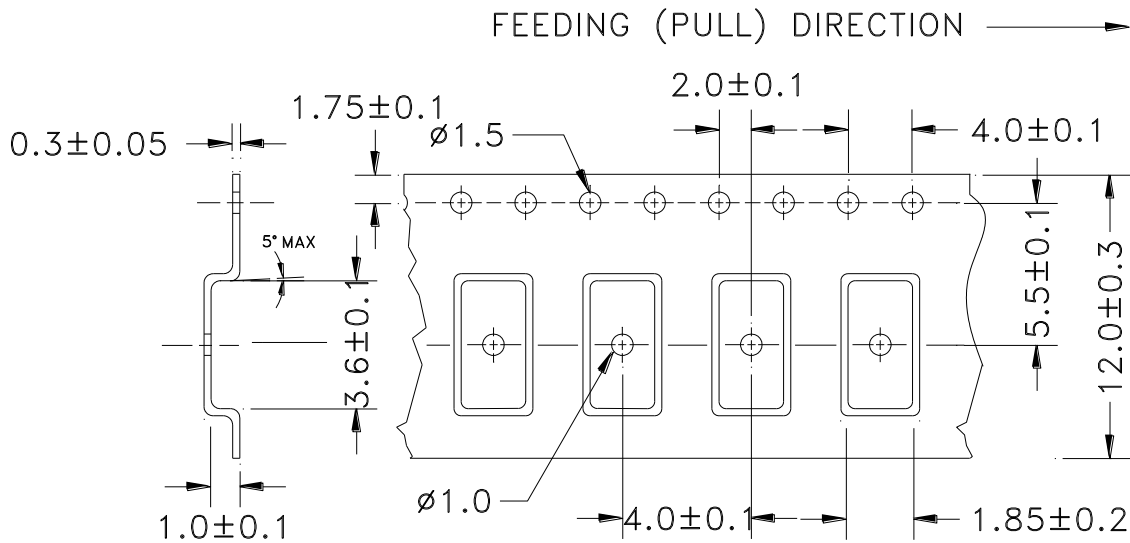
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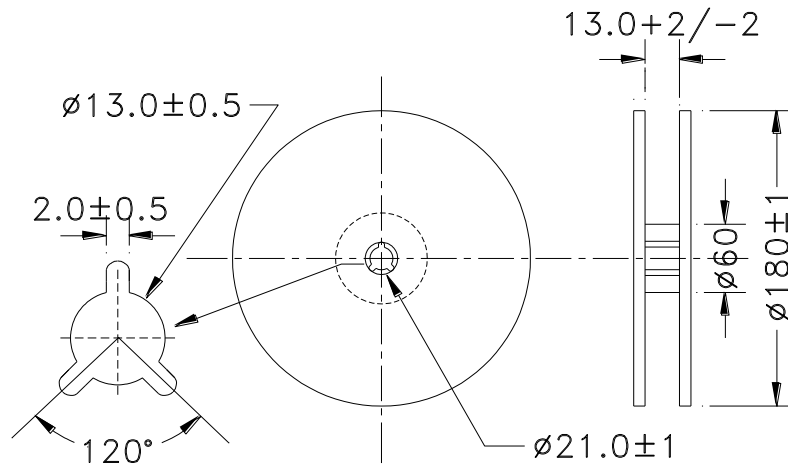
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## Packaging

T=Tape and reel (3,000pcs/reel)  
 T9=Tape and reel (9,000pcs/reel)



Reel=3,000pcs





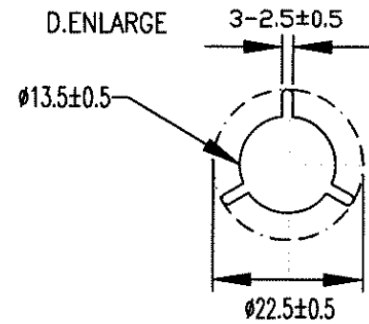
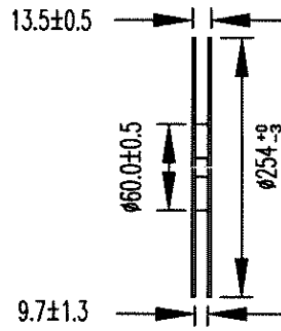
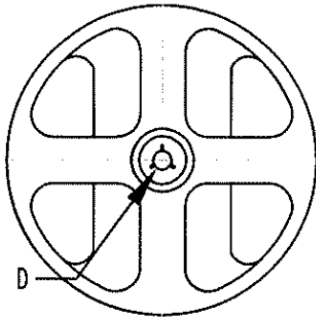
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## Packaging

Reel=9,000pcs



Dimensions: mm

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