

Description

The ABS04A series is a tuning fork 32.768kHz quartz crystal offered in a 1.27mm x 1.05mm x 0.5mm two-pad SMD package. The ABS04A series offers an industry standard frequency tolerance at +25°C±3°C ±20ppm, an operating temperature range of -40°C to +85°C, and load capacitance (CL) options that are commonly integrated into commercial and industrial end applications such as wearables, measuring equipment, and wireless devices.



Features

- 32.768kHz tuning fork resonator with low plating load
- Compatible with industry standard 1.2 x 1.0 x 0.5 mm SMD package
- Available with ±20 ppm set tolerance and extended operating temperature of -40°C to +85°C
- Hermetically sealed package for long term reliability
- Excellent environmental and heat resistance
- Guaranteed ESR of 90kΩ maximum for low power designs
- [REACH/RoHS II Compliant](#) | [MSL Level 1](#)

Typical Applications

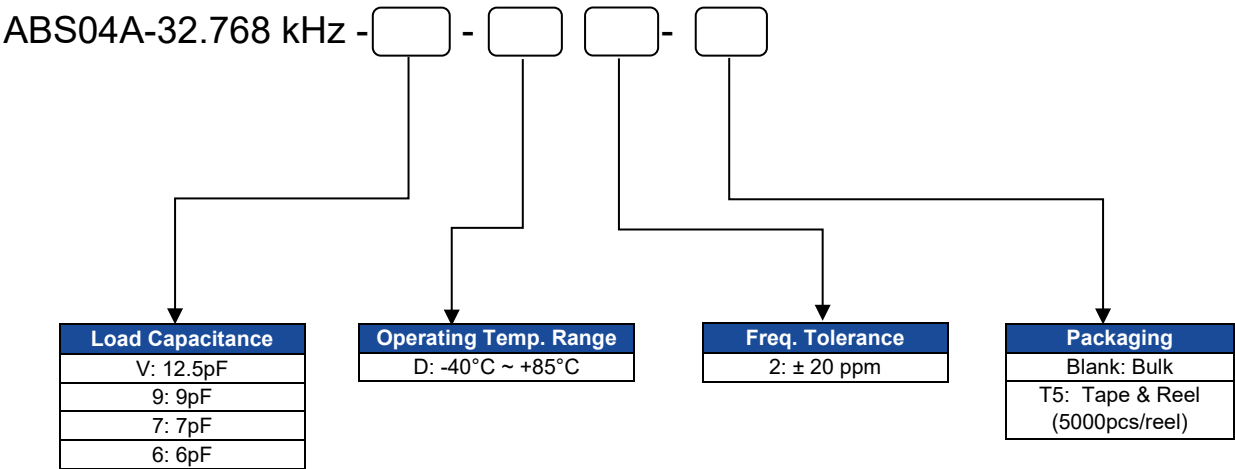
- Wearables
- Wireless communications
- Internet of Things (IoT)
- Commercial, consumer and industrial applications
- Bluetooth/Bluetooth Low Energy (BLE)
- Machine-to-Machine (M2M) Connectivity
- Ultra Low Power MCU
- Communication & Measuring Equipment

Electrical Specifications [Note 1]

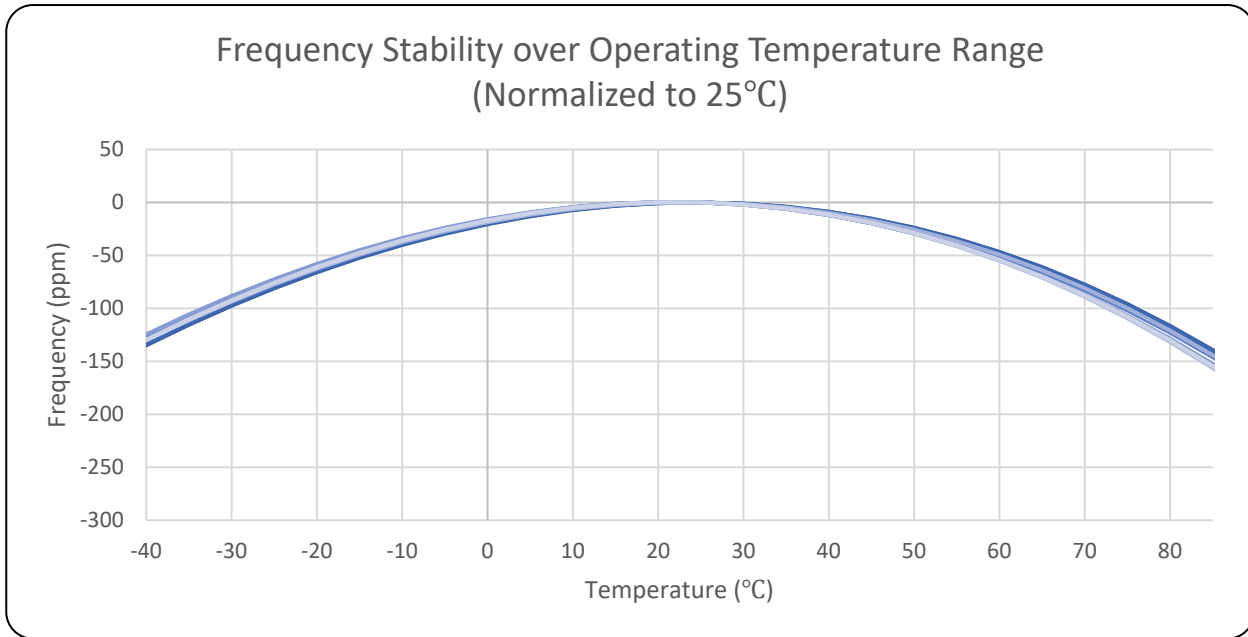
Parameters	Min.	Typ.	Max.	Units	Notes
Frequency	32.768			KHz	
Operation Mode	Flexural Mode (Tuning Fork)				
Operating Temperature	-40		+85	°C	
Storage Temperature	-55		+125	°C	
Frequency Tolerance @ +25°C	-20		+20	ppm	
Temperature Coefficient:	-0.04	-0.036	-0.032	ppm/T ²	
Turn-over temperature:	+20	+25	+30	°C	
Load capacitance (CL)	12.5			pF	
Equivalent Series Resistance (ESR)			90	kΩ	@ +25±3°C
Shunt Capacitance (C0)		1.4	2.0	pF	
Drive Level		0.1	0.3	μW	
Aging	-5		+5	ppm	@ +25°C±3°C [First Year]
Insulation Resistance	300			MΩ	@ 100Vdc ± 15V

Note 1: Measurement at +25°C±3°C, Nominal CL, DL = 0.1μW, unless otherwise specified

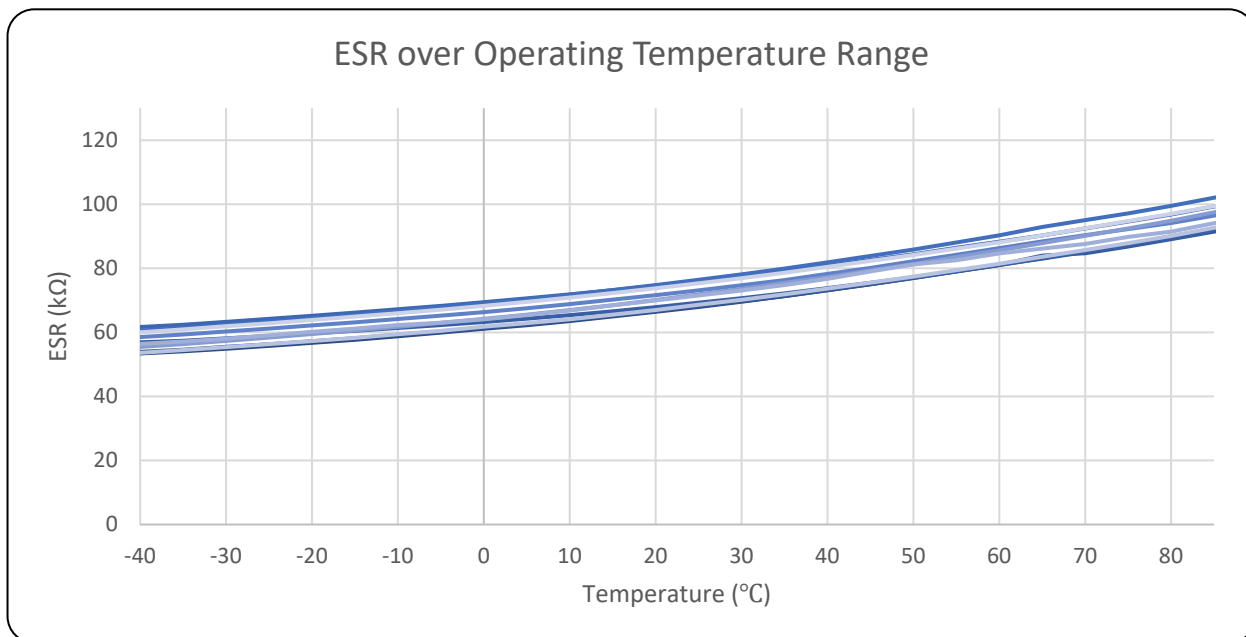
Part Identification



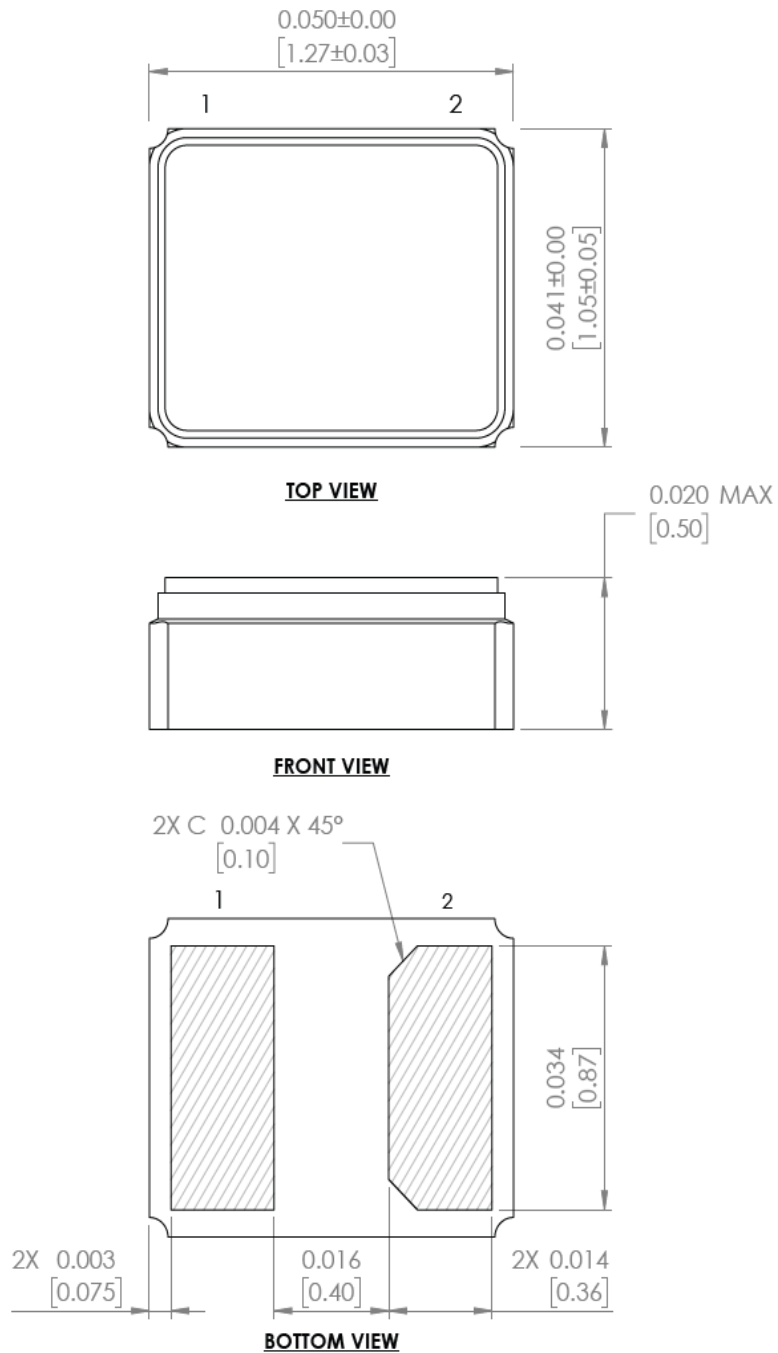
Typical Frequency vs. Temperature Characteristics



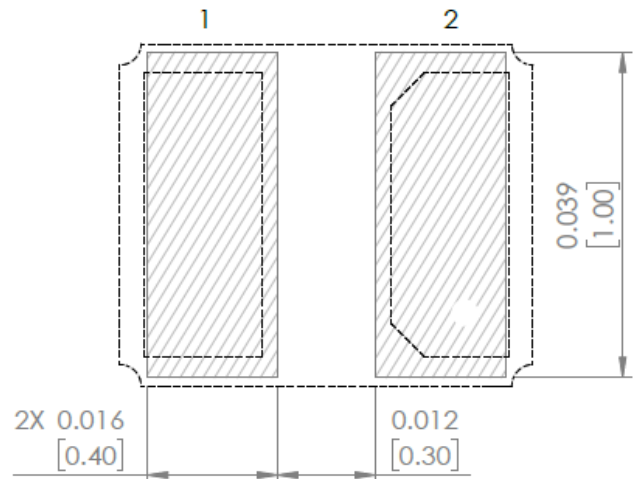
Typical Frequency vs. Temperature Characteristics



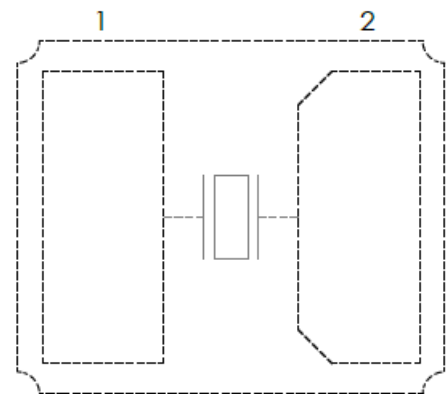
Mechanical Dimensions



RECOMMENDED LAND PATTERN



CIRCUIT DIAGRAM



Dimensions: inches (mm)

Reflow Profile [JEDEC J-STD-020]

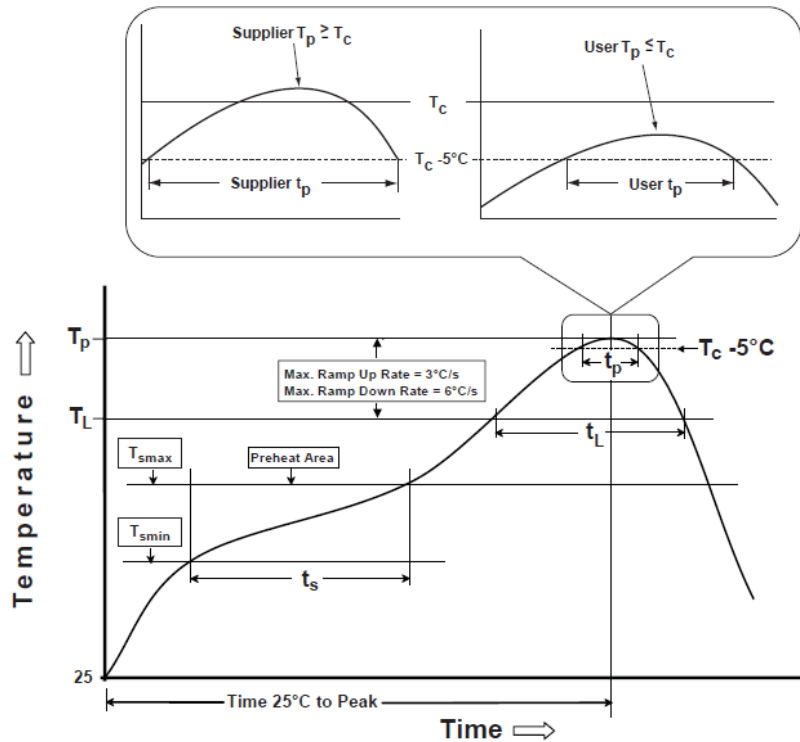


Table 1

SnPb Eutectic Process
Classification Temperatures (T_c)

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

Table 2

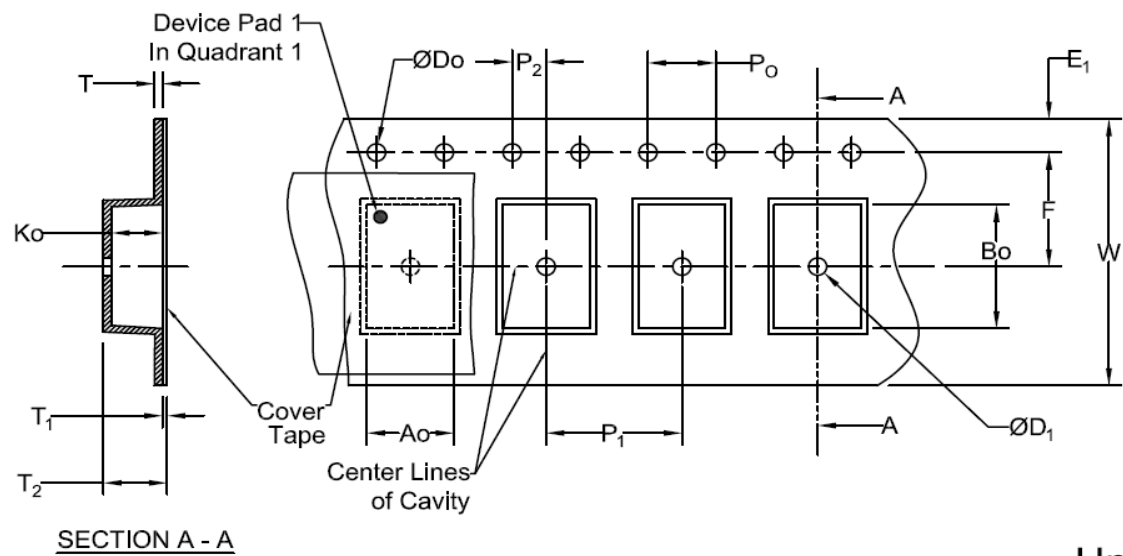
Pb-Free Process
Classification Temperatures (T_c)

Package Thickness	Volume mm ³ <350	Volume mm ³ 350-2000	Volume mm ³ >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

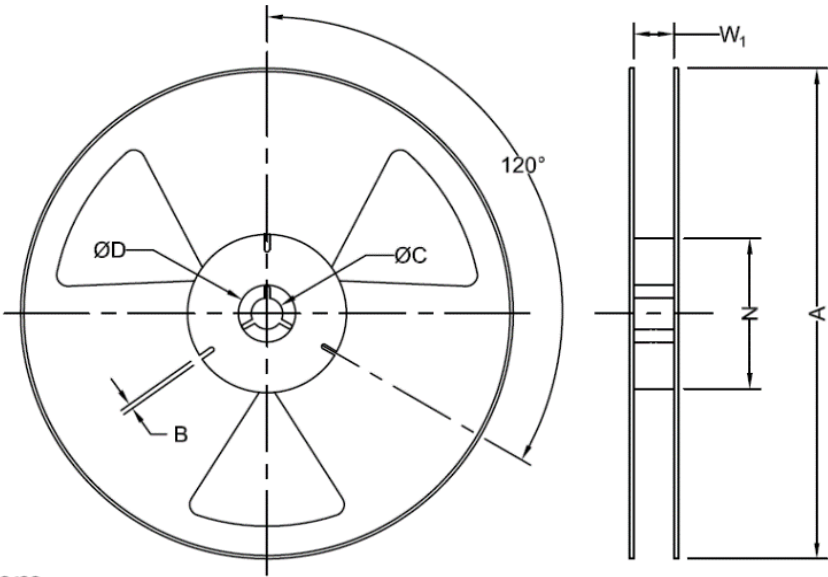
Profile Feature	Sn-Pb Eutectic Assembly	Pb-Free Assembly
Preheat / soak		
Temperature minimum (T_{smin})	100°C	150°C
Temperature maximum (T_{smax})	150°C	200°C
Time (T_{smin} to T_{smax}) (t_s)	60 - 120 sec.	60 - 120 sec.
Average ramp-up rate (T_{smax} to T_p)	3°C/sec. max	3°C/sec. max
Liquidous temperature (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.

Packaging



Tape Specifications (mm)							
Width	Ao	Bo	Do	D ₁ (Min)	E ₁	F	Ko
8mm	*	*	1.5+0.1/-0.0	1.0	1.75±0.1	3.5±0.05	*
Width	P ₁	P ₂	P ₀	T (Max)	T ₁ (Max)	T ₂ (Max)	W (Max)
8mm	4.0±0.1	2.0±0.05	4.0±0.1	0.6	0.1	2.5	8.3



Unit: mm

Tape Specifications (mm)							
Width	Qty/Reel	A (Nom)	B (Min)	C (Min)	D (Min)	N (Min)	*W ₁
8mm	5000	178	1.5	13.0+0.5/-0.2	20.2	50	8.4+1.5/-0.0