

Description

The ABS05N series is a tuning fork 32.768kHz quartz crystal offered in a 1.6mm x 1.0mm x 0.5mm two-pad SMD package. The ABS05N series offers industry standard frequency accuracy @ $+25^{\circ}\text{C} \pm 3^{\circ}\text{C}$ ($\pm 20\text{ppm}$), operating temperature range (-40°C to +85°C), load capacitance (CL), and Equivalent Series Resistance (ESR) electrical performance options that are commonly integrated into commercial and industrial end applications such as communication equipment, measuring equipment, and wireless devices.



Features

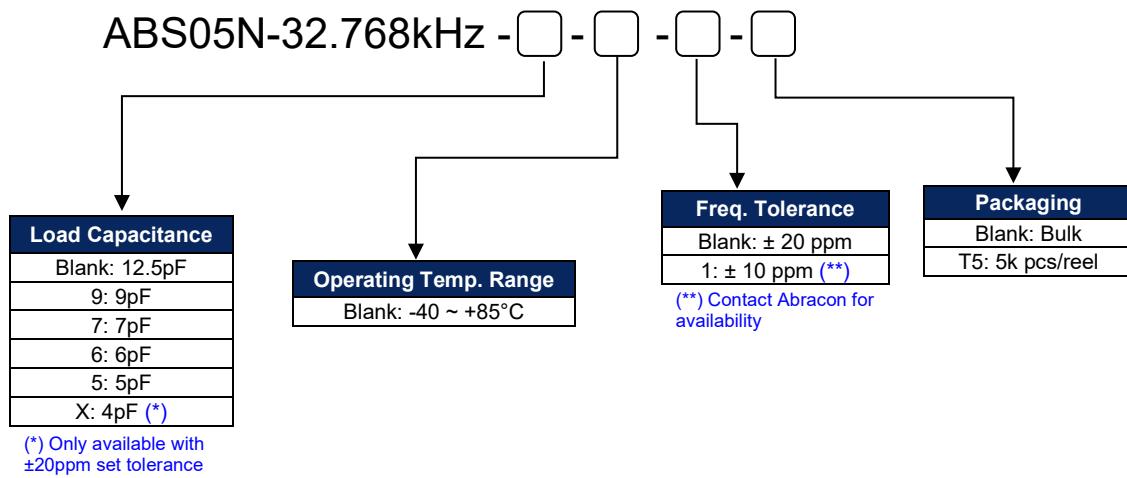
- Small form factor Tuning Fork Crystal (1.60 x 1.00 x 0.50 mm package)
- Low profile- ideal for height constraint designs
- Available with standard ± 20 ppm set-tolerance
- Extended temperature -40°C to +85°C for industrial applications
- [REACH/RoHS II Compliant](#) | MSL Level N/A

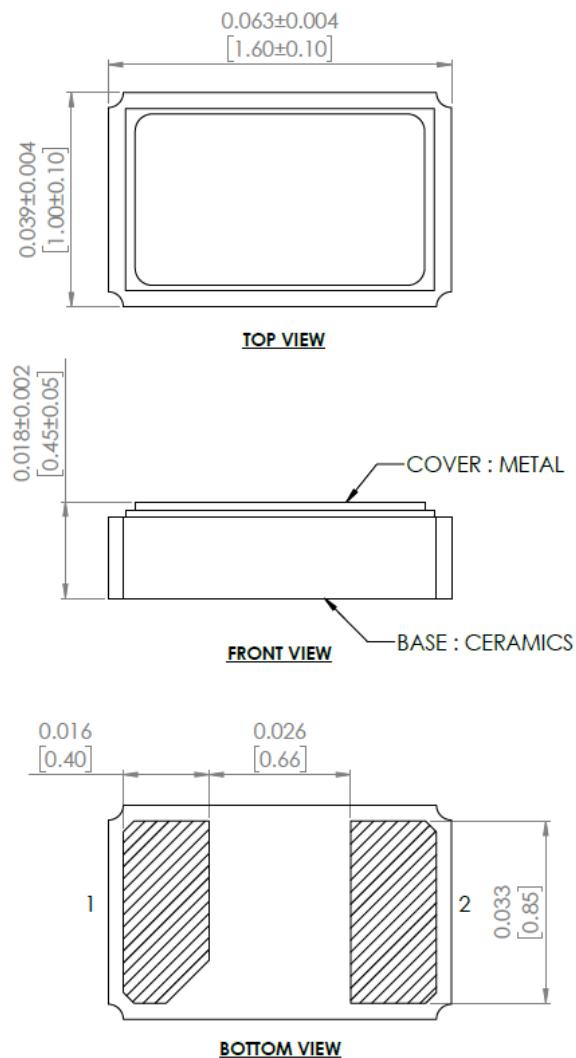
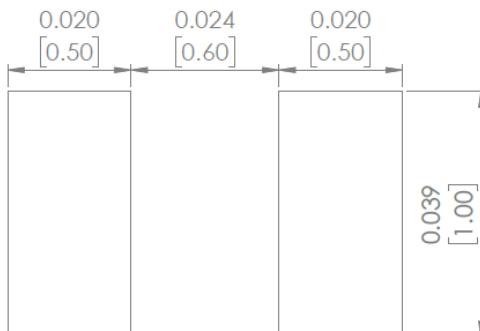
Typical Applications

- Wireless Modules
- Internet of Things (IoT)
- Bluetooth / Bluetooth Low Energy (BLE)
- Commercial & Industrial Applications
- Low Power MCU's, SoC's, Transceivers
- Communication & Measuring Equipment

Electrical Specifications

Parameters	Min.	Typ.	Max.	Units	Notes
Frequency		32.768		kHz	
Operation Mode		Flexural Mode (Tuning Fork)			
Operating Temperature Range	-40		+85	°C	
Storage Temperature Range	-55		+125	°C	
Frequency Tolerance @ $+25^{\circ}\text{C} \pm 3^{\circ}\text{C}$	-20		+20	ppm	doesn't include aging
Temperature Coefficient	-0.04	-0.03	-0.02	ppm/T ²	
Turn-over Temperature	+20	+25	+30	°C	
Equivalent Series Resistance (R1)			60	kΩ	
Shunt capacitance (C0)			1.85	pF	
Load Capacitance (CL)		12.5		pF	See options
Drive Level		0.1	0.5	μW	
Aging (First year) @ $+25^{\circ}\text{C}$	-3		+3	ppm	
Insulation Resistance	500			MΩ	@ 100Vdc $\pm 15\text{V}$

Part Identification

Mechanical Dimensions**RECOMMENDED LAND PATTERN****Dimensions: inches [mm]**

Reflow Profile [JEDEC J-STD-020]

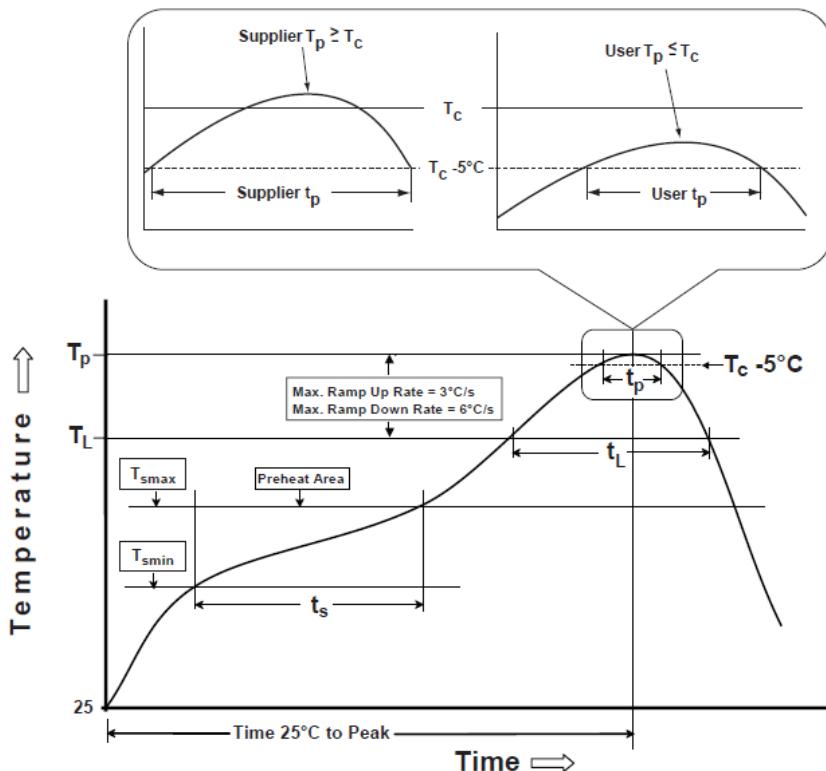


Table 1

**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

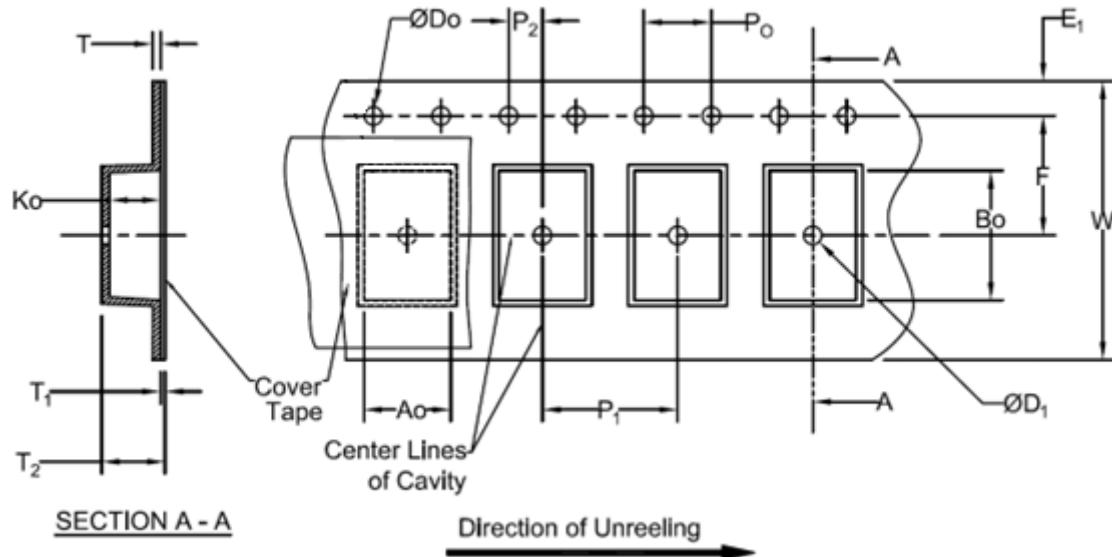
Profile Feature	Sn-Pb Eutectic Assembly	Pb-Free Assembly
Preheat / soak		
Temperature minimum (T_{smin})	100°C	150°C
Temperature maximum (T_{smax})	150°C	200°C
Time (T_{smin} to T_{smax}) (t_s)	60 - 120 sec.	60 - 120 sec.
Average ramp-up rate (T_{smax} to T_p)	3°C/sec. max	3°C/sec. max
Liquidous temperature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

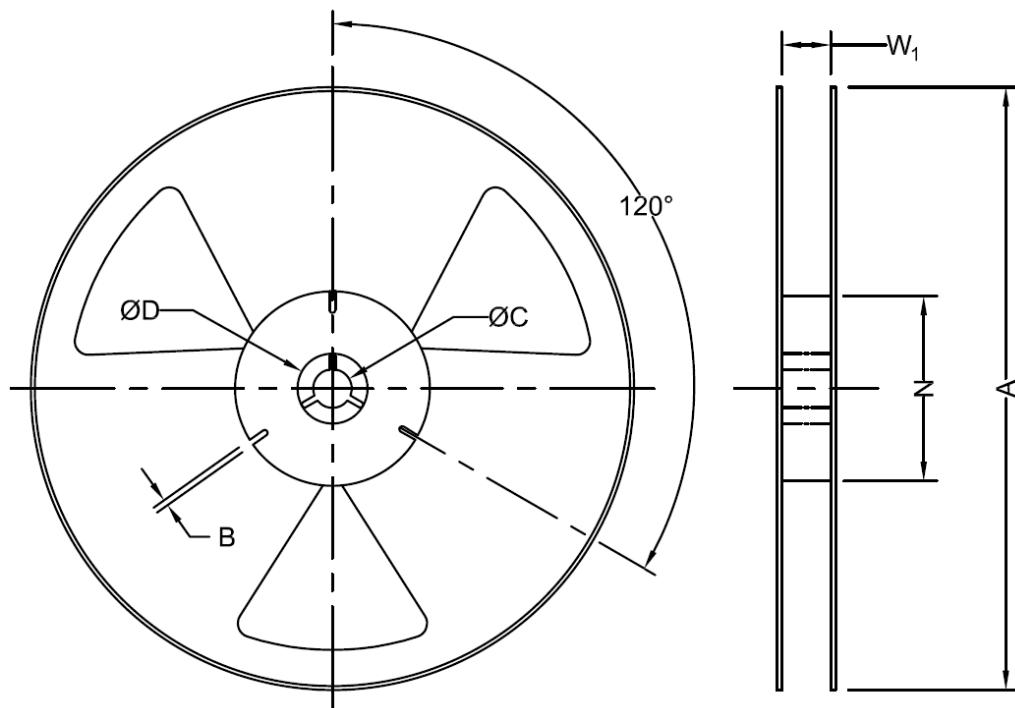
T5: Tape and reel (5,000pcs/reel)



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

***Note: Compliant to EIA-481**

Dimensions: mm

Packaging continued


Reel 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

***Note: Measured at Hub**

Dimensions: mm