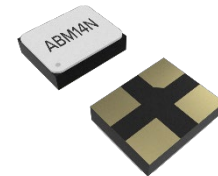


**Description**

The ABM14N series is an ultra-miniature AT-Cut MHz quartz crystal offered in a 1.0mm x 0.8mm x 0.25mm four-pad SMD package. Tight frequency accuracy and stability of  $\pm 10$ ppm over operating temperature range of  $-30^{\circ}\text{C}$  to  $+85^{\circ}\text{C}$ , low plating load (CL) value of 8pF, and low Equivalent Series Resistance (ESR) is still achieved in the ultra-compact and thin package size. The ABM14N series offers industry standard frequencies (40MHz, 48MHz, 52MHz, 59.97MHz, 60MHz, 76.8MHz, 80MHz), common for wearables, IoT, Bluetooth / Bluetooth Low Energy (BLE), and Ultra-Low Power MCU's/SoC's/Transceivers end applications.



**Features**

- Ultra-miniature At-Cut MHz Crystal (1.00 x 0.8 x 0.25mm package)
- Ideally suited for space constraint IoT, Wearables & Wireless applications
- Simultaneously optimized for low plating load & ESR over extended temperature range
- Enhanced performance for start-up time and power savings with Low Energy SoC's
- Low profile ideal for height constraint designs feature
- [REACH/RoHS II Compliant | MSL Level N/A](#)

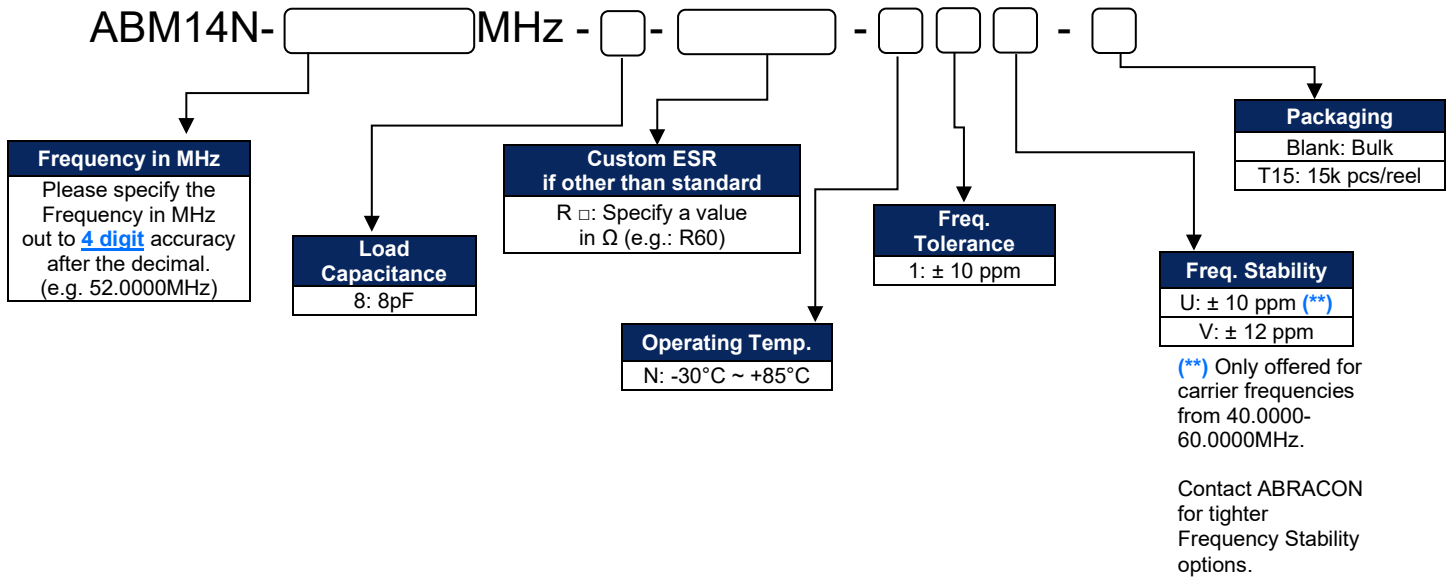
**Typical Applications**

- Wearables
- Wireless Modules
- Internet of Things (IoT)
- Bluetooth / Bluetooth Low Energy (BLE)
- Machine-to-Machine (M2M) Connectivity
- Ultra-Low Power MCU's, SoC's, Transceivers
- Near Field Communication
- ISM Band Applications

**Electrical Specifications**

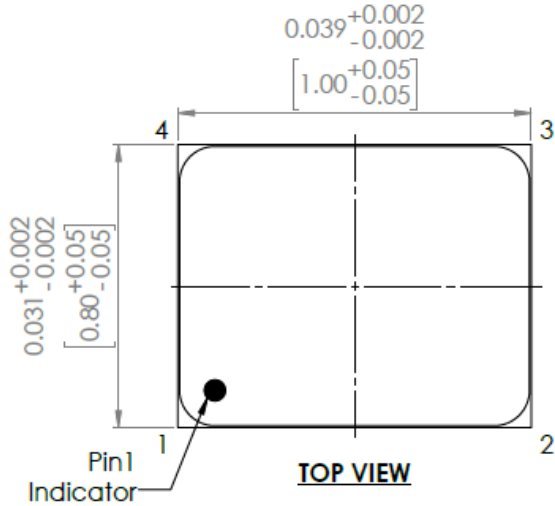
Parameters	Min.	Typ.	Max.	Units	Notes
Frequency Range	40.0000		80.0000	MHz	
Standard Available Frequencies	40.0000, 48.0000, 52.0000, 59.9700, 60.0000, 76.8000, 80.0000			MHz	Contact Abracon for Nonstandard Frequencies
Operation Mode	Fundamental				
Operating Temperature Range	-30		+85	$^{\circ}\text{C}$	
Storage Temperature Range	-40		+85	$^{\circ}\text{C}$	
Frequency Tolerance @ $+25^{\circ}\text{C}$	-10		+10	ppm	
Frequency Stability over the Operating Temperature Range (ref. to $+25^{\circ}\text{C}$ )	-10		+10	ppm	40.0000 – 60.0000MHz
	-12		+12	ppm	76.8000 – 80.0000MHz
Equivalent Series Resistance (R1)			60	$\Omega$	40.0000 – 60.0000MHz
			30	$\Omega$	76.8000 – 80.0000MHz
Load Capacitance (CL)		8.0		pF	
Drive Level		10	100	$\mu\text{W}$	
Aging (1 year) @ $+25^{\circ}\text{C}$	-1		+1	ppm	40.0000 – 60.0000MHz
	-3		+3	ppm	76.8000 – 80.0000MHz
Insulation Resistance	500			M $\Omega$	@ 100Vdc $\pm$ 15V
Air-tightness			$1.1 \times 10^{-9}$	Pa m <sup>3</sup> /s	

**Part Identification** [\[Note 1\]](#)

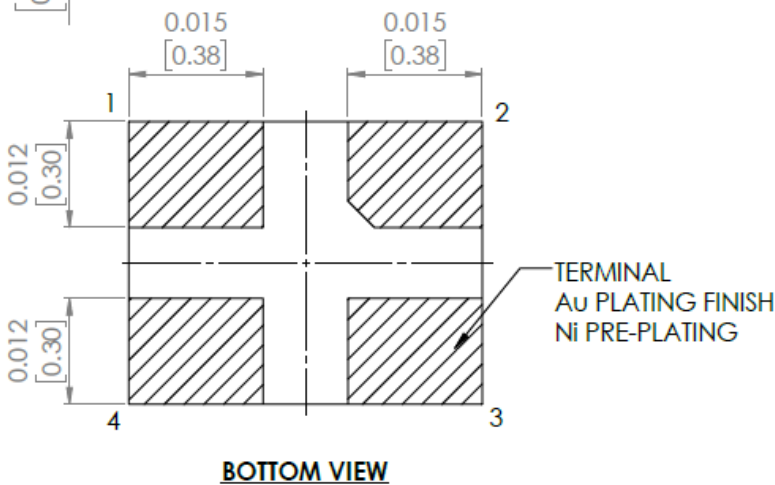
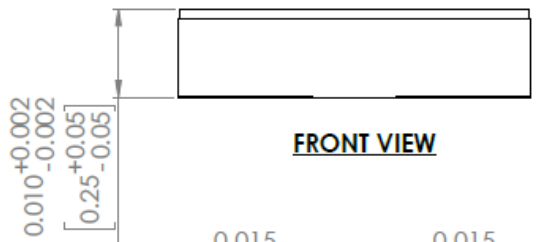
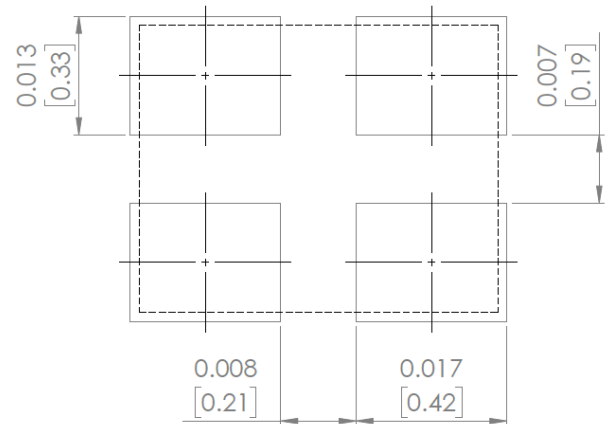


Note 1: Contact Abracon for part number requests with carrier frequency callouts up to 5 & 6 digit accuracy after the decimal.

**Mechanical Dimensions**



**RECOMMENDED LAND PATTERN**



Pin #	Function
1	XTAL
2	GND (Connection with cover)
3	XTAL
4	GND (Connection with cover)

**Dimensions: inches [mm]**

Reflow Profile [JEDEC J-STD-020]

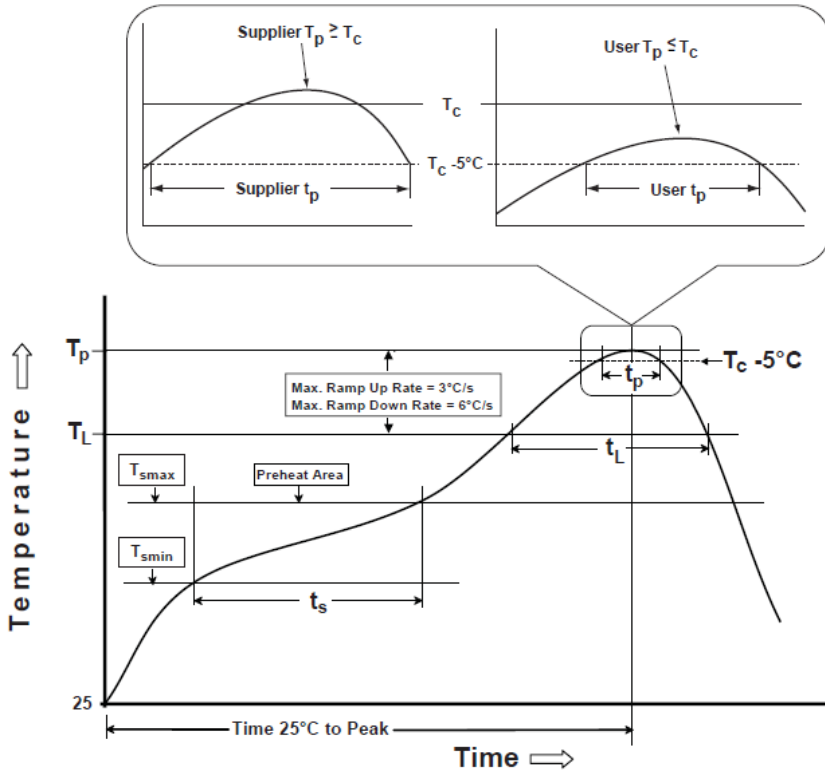


Table 1

SnPb Eutectic Process Classification Temperatures ( $T_c$ )		
Package Thickness	Volume $\text{mm}^3$ <350	Volume $\text{mm}^3$ $\geq$ 350
<2.5 mm	235 °C	220 °C
$\geq$ 2.5 mm	220 °C	220 °C

Table 2

Pb-Free Process Classification Temperatures ( $T_c$ )			
Package Thickness	Volume $\text{mm}^3$ <350	Volume $\text{mm}^3$ 350-2000	Volume $\text{mm}^3$ >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

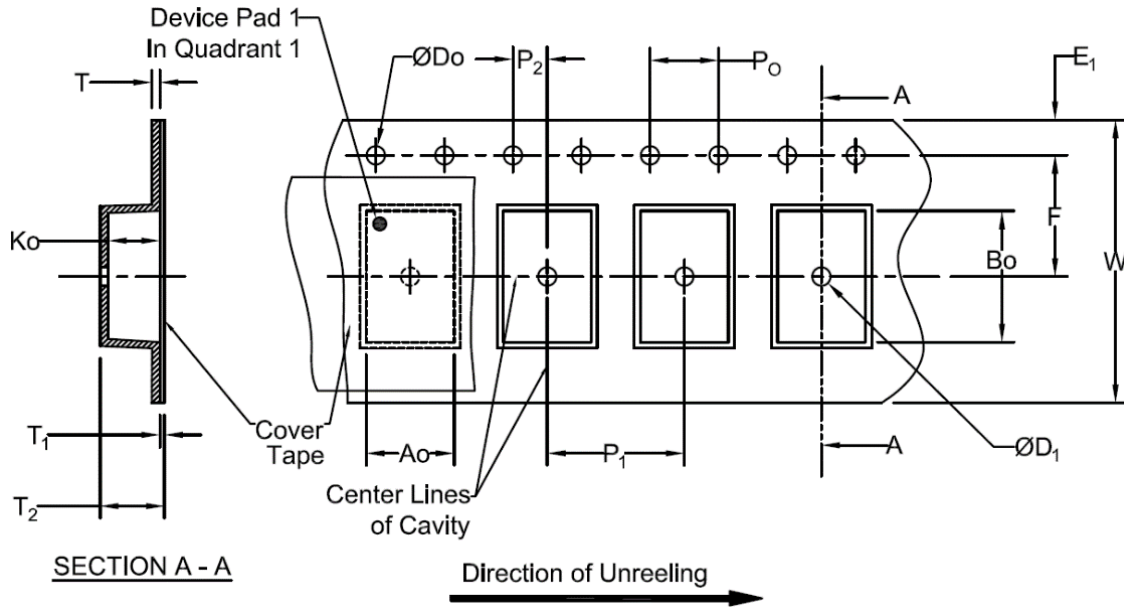
Profile Feature	Sn-Pb Eutectic Assembly	Pb-Free Assembly
Preheat / soak		
Temperature minimum ( $T_{smin}$ )	100°C	150°C
Temperature maximum ( $T_{smax}$ )	150°C	200°C
Time ( $T_{smin}$ to $T_{smax}$ ) ( $t_s$ )	60 - 120 sec.	60 - 120 sec.
Average ramp-up rate ( $T_{smax}$ to $T_p$ )	3°C/sec. max	3°C/sec.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

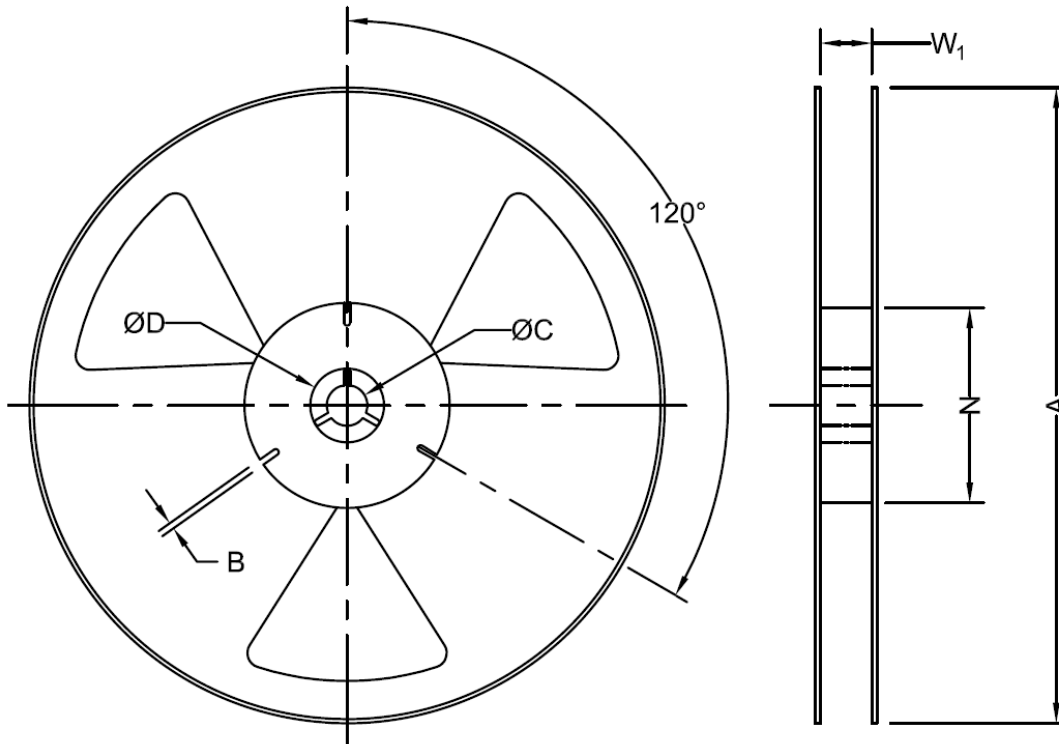
**T15: Tape and reel (15,000pcs/reel)**



Tape Specifications (mm)							
<b>Width</b>	Ao	Bo	Do	D <sub>1</sub>	E <sub>1</sub>	F	Ko
<b>8mm</b>	*	*	1.5+0.1/-0.0	0.4±0.05	1.75±0.1	3.5±0.05	*
<b>Width</b>	P <sub>1</sub>	P <sub>2</sub>	P <sub>0</sub>	T	T <sub>1</sub>	T <sub>2</sub>	W
<b>8mm</b>	4.0±0.1	2.0±0.05	4.0±0.1	0.2±0.05	0.35±0.05	0.55±0.05	8.0±0.2

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

**Packaging continued**



Reel Specifications (mm)							
Width	Qty/Reel	A	B	C	D	N	*W <sub>1</sub>
8mm	15000	330±2.0	2.0±0.5	13±0.2	21.0±0.8	100±1.0	9.5±1.0

**\*Note: Measured at Hub**

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