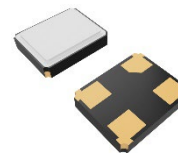


Description

The ABM11N series is an AT-Cut MHz quartz crystal offered in a 2.0mm x 1.6mm x 0.5mm four-pad SMD package. Tight frequency accuracy of ± 10 ppm and stability of ± 15 ppm over operating temperature range of -40°C to $+85^{\circ}\text{C}$, low plating load (CL) value of 4pF, and low Equivalent Series Resistance (ESR) is achieved in this compact package. The ABM11N series offers industry standard frequencies common for wearables, IoT, Bluetooth / Bluetooth Low Energy (BLE), and Ultra-Low Power MCU's/SoC's/Transceivers end applications.



Features

- Optimized for energy saving wearables and IoT applications
- Plated at exceptionally low plating capacitance, as low as 4pF, with optimized ESR
- 0.5 mm max height ideally suited for height constrained designs
- Seam sealed for long-term reliability
- [REACH/RoHS II Compliant](#) | [MSL Level N/A](#)

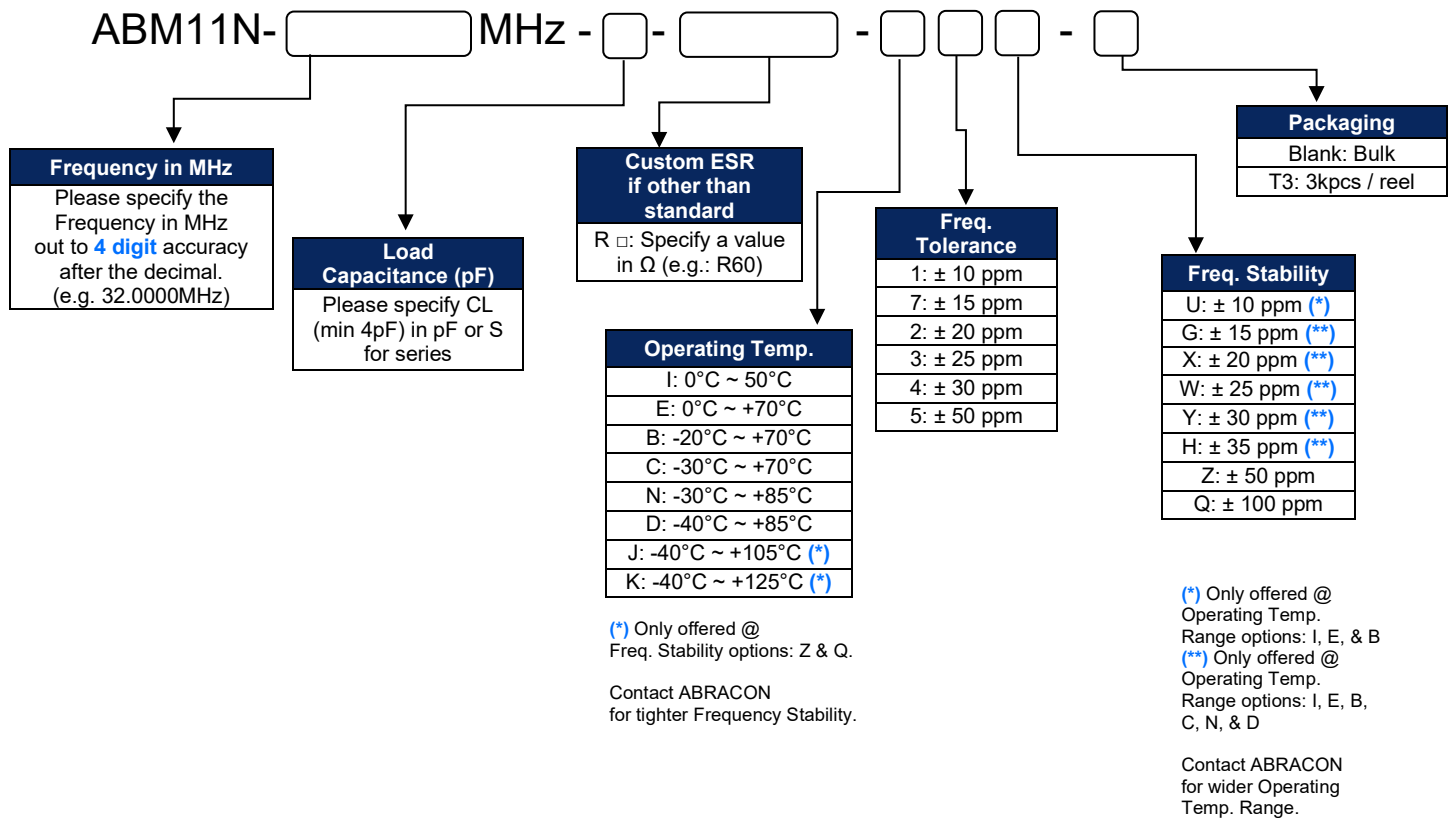
Typical Applications

- 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

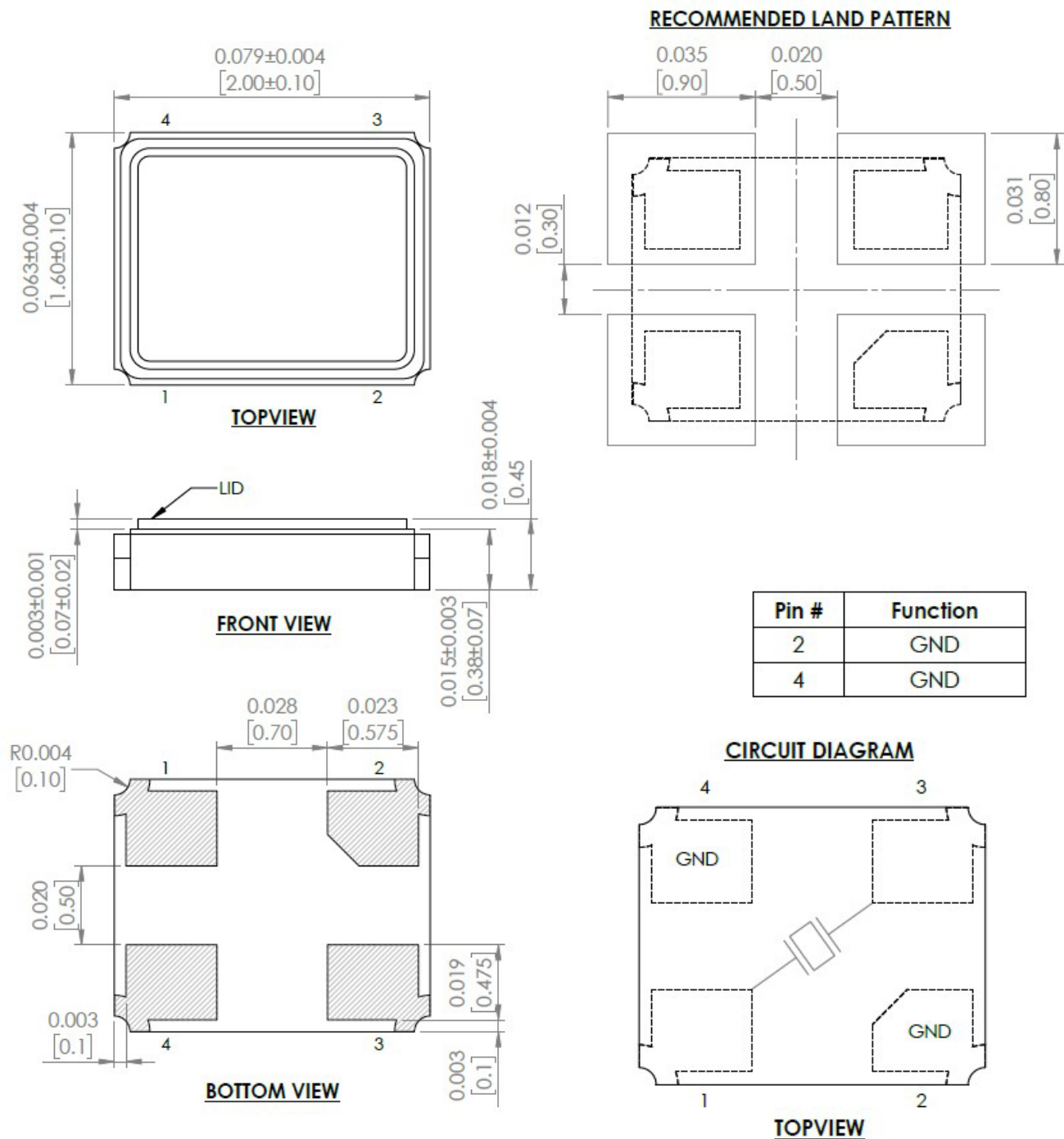
Parameters	Min.	Typ.	Max.	Units	Notes
Frequency Range	16.0000		50.0000	MHz	
Operation Mode	Fundamental				
Operating Temperature Range	-40		+125	$^{\circ}\text{C}$	See options
Storage Temperature	-55		+125	$^{\circ}\text{C}$	
Frequency Tolerance @ $+25^{\circ}\text{C}$	-10		+10	ppm	See options
Frequency Stability over the Operating Temperature (ref. to $+25^{\circ}\text{C}$)	-10		+10	ppm	See options
Equivalent series resistance "R1" (over Operating Temperature Range) (CL=4pF)		< 150	200	Ω	16.0000 – 17.9999MHz
		< 80	120		18.0000 – 20.9999MHz
		< 60	100		21.0000 – 29.9999MHz
		< 50	80		30.0000 – 37.9999MHz
		< 30	60		38.0000 – 50.0000MHz
Equivalent series resistance "R1" (over Operating Temperature Range) (CL=6pF, 7pF, 8pF)		< 120	150	Ω	16.0000 – 17.9999MHz
		< 80	120		18.0000 – 20.9999MHz
		< 60	100		21.0000 – 29.9999MHz
		< 30	50		30.0000 – 37.9999MHz
		< 30	50		38.0000 – 50.0000MHz
Shunt Capacitance (C0)		< 1.0	2.0	pF	
Load Capacitance (CL)		4.0		pF	See options
Drive Level		10		μW	
Aging (1 year)	-2		+2	ppm	@ $25^{\circ}\text{C} \pm 3^{\circ}\text{C}$
Insulation Resistance	500			M Ω	@ 100Vdc $\pm 15\text{V}$

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



Dimensions: inches [mm]

Reflow Profile [JEDEC J-STD-020]

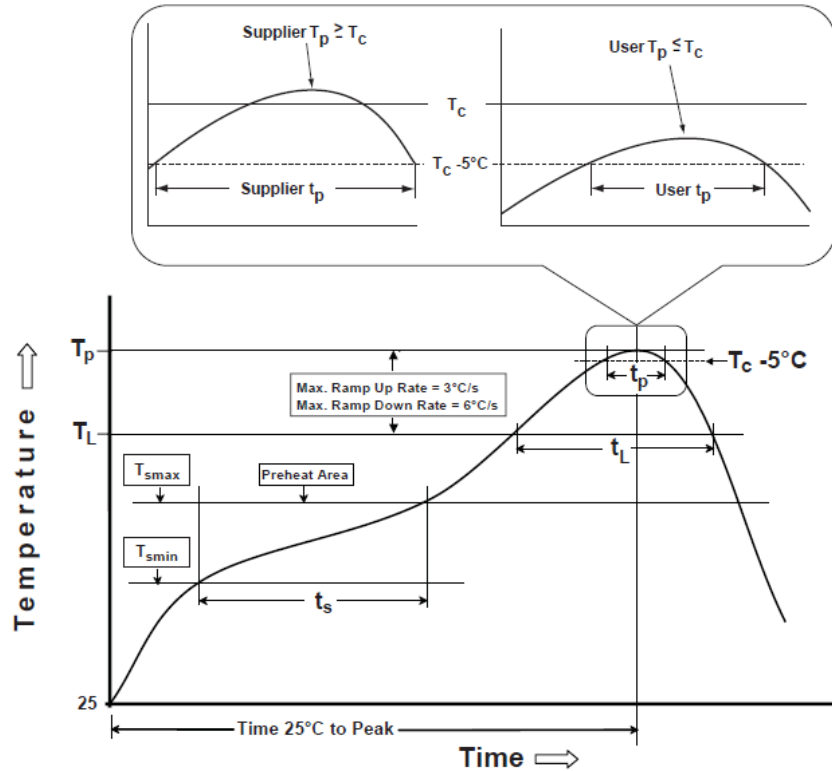


Table 1

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

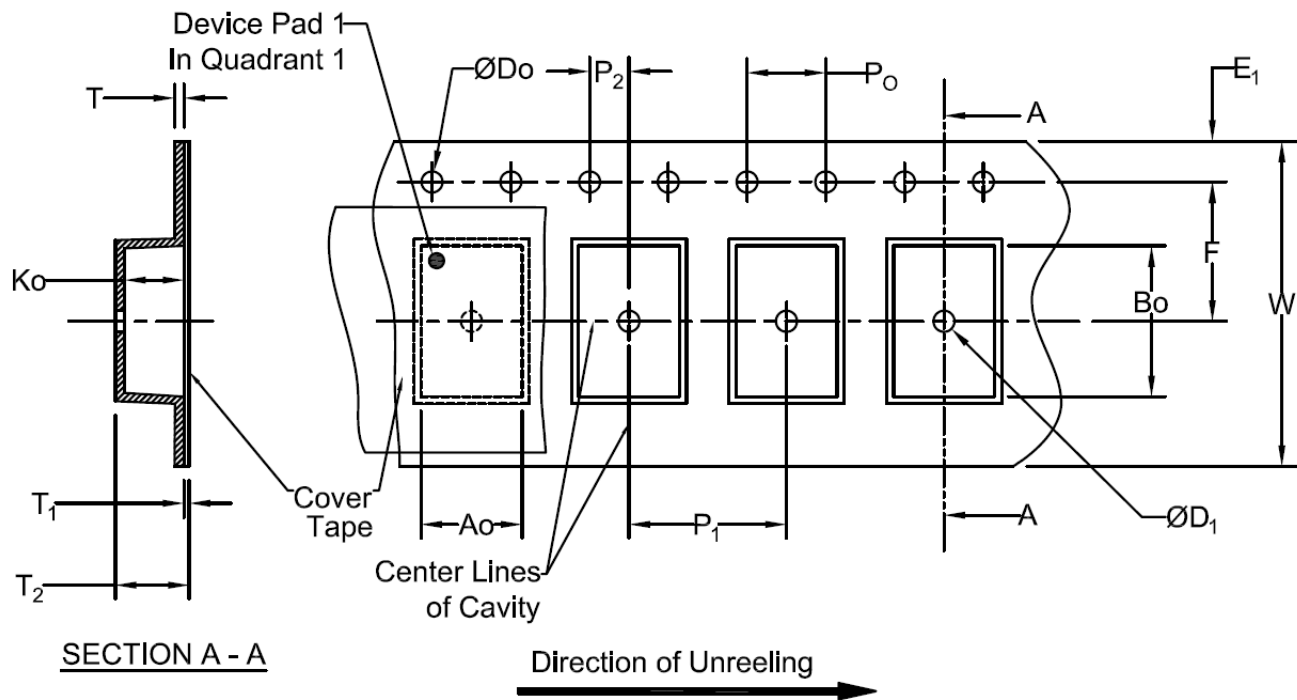
Pb-Free Process
Classification Temperatures (T_c)

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 a supplier minimum and a user maximum.

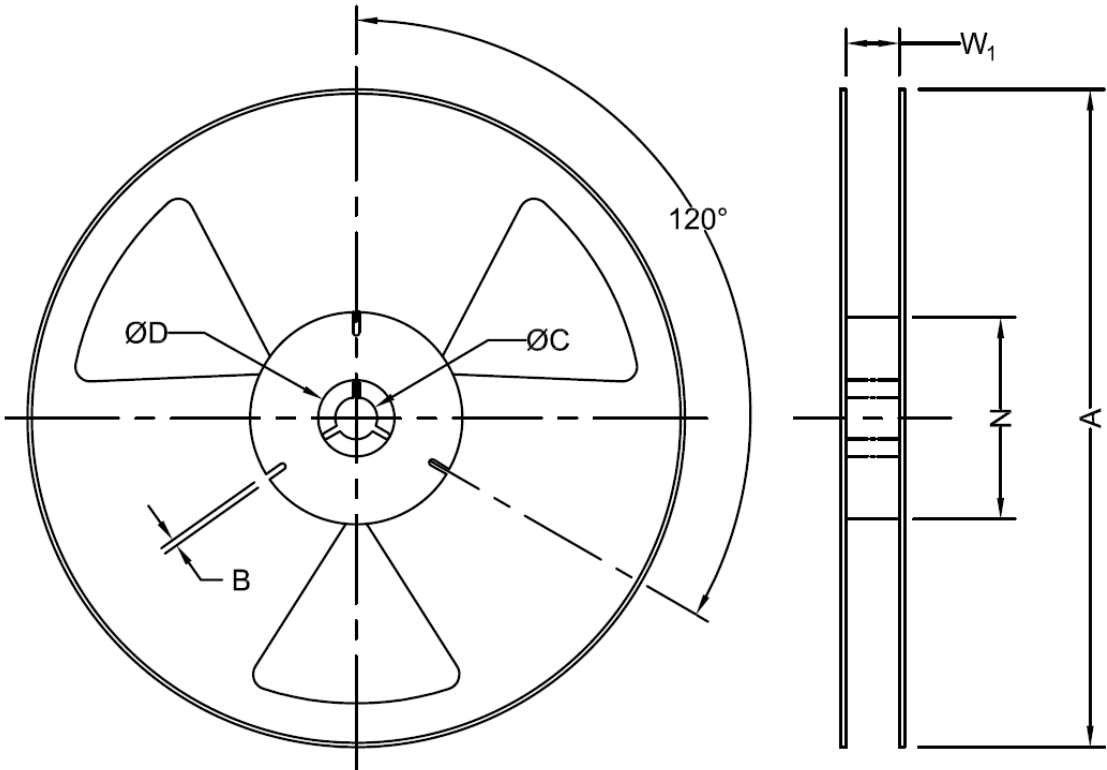
Packaging



Tape Specifications (mm)							
Width	Ao	Bo	Do	D1	E1	F	Ko
8mm	*	*	1.5+0.1/-0.0	1.0	1.75±0.1	3.5±0.05	*
Width	P1	P2	P0	T (Max)	T1 (Max)	T2 (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**

Packaging continued



Reel Specifications (mm)							
Width	Qty/Reel	A (Nom)	B (Min)	C (Min)	D (Min)	N (Min)	*W ₁
8mm	3000	178	1.5	13.0+0.5/-0.2	20.2	50	8.4+1.5/-0.0

*Note: Measured at Hub