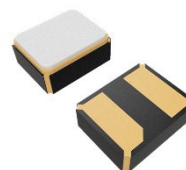


Automotive Grade Ceramic Base SMD 2-pad Crystal

Description

The ABM11AAIG series is an Automotive Grade AEC-Q200 qualified AT-Cut fundamental mode MHz quartz crystal offered in a 2.0mm x 1.6mm x 0.8mm two-pad SMD package. Tight frequency accuracy of $\pm 15\text{ppm}$ at room temperature ($+25^{\circ}\text{C}$) with frequency stability as low as $\pm 50\text{ppm}$ over operating temperature range of -40°C to $+125^{\circ}\text{C}$ is achieved in industry-standard carrier frequencies common for Infotainment Systems, Keyless Entry and Startup, GPS and Navigation, ADAS (Advanced Driver Assistance Systems), Vehicle to Vehicle Communication, LiDAR (Light Detection and Ranging), and In-vehicle Networking end applications.



Features

- AEC-Q200 Qualified
- Automotive Grade 1: -40°C to $+125^{\circ}\text{C}$
- TS16949 Production Line Certified
- PPAP Available Upon Request
- [REACH/RoHS II Compliant](#) | MSL Level = 1

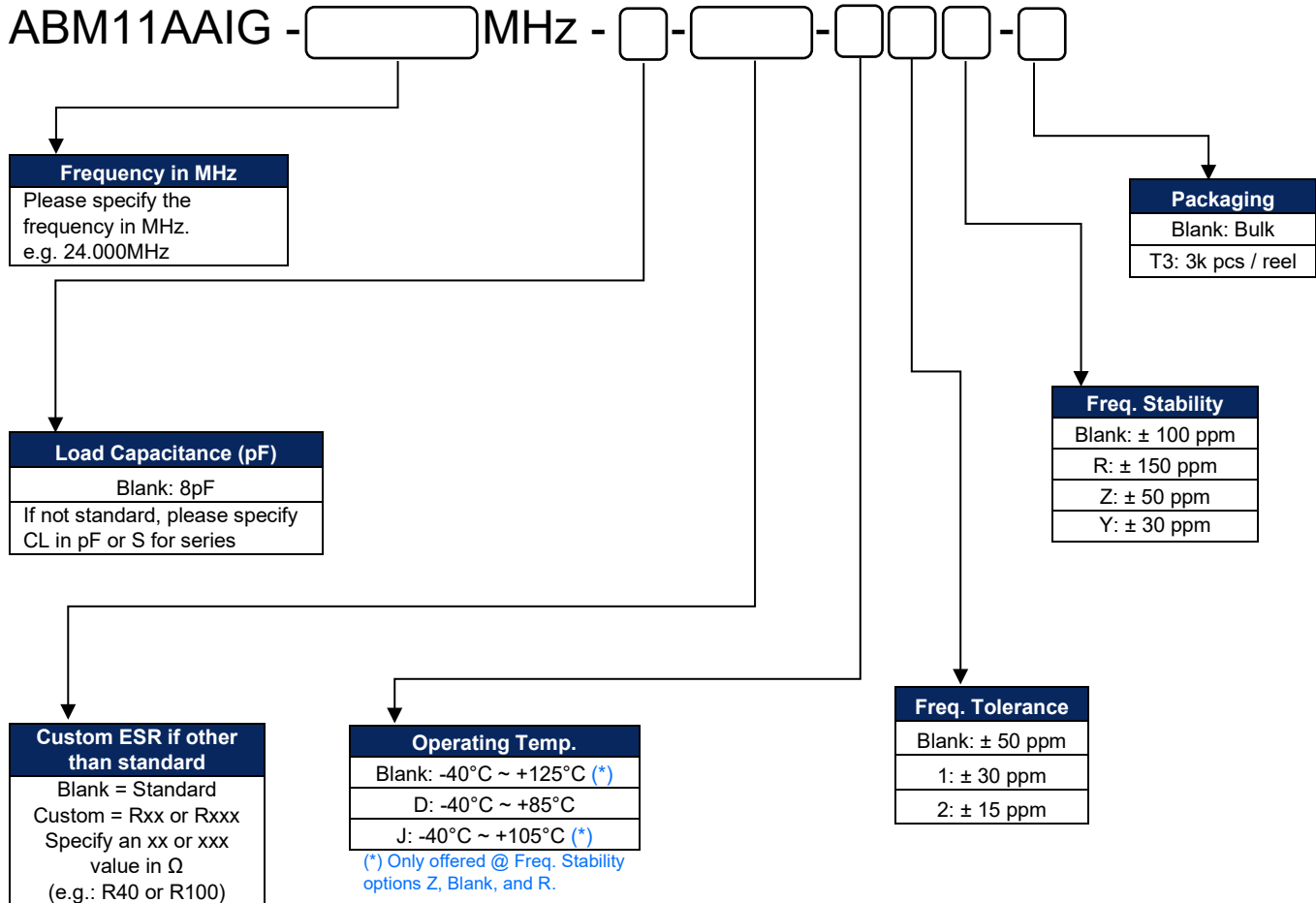
Typical Applications

- 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

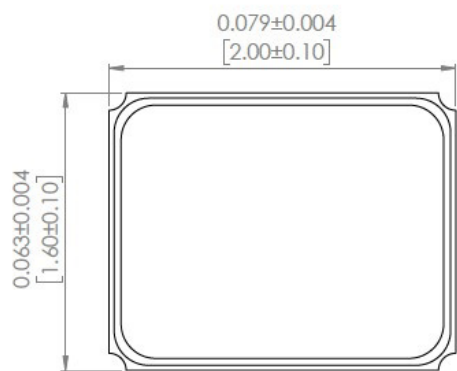
Parameters	Min.	Typ.	Max.	Units	Notes
Frequency Range	16.000		60.000	MHz	
Operation Mode	Fundamental (AT-cut)				
Operating Temperature	-40		+125	$^{\circ}\text{C}$	Option "blank"; See options
Storage Temperature	-55		+125	$^{\circ}\text{C}$	
Frequency Tolerance @ $+25^{\circ}\text{C}$	-50		+50	ppm	Option "blank"; See options
Frequency Stability over the Operating Temperature (ref. to $+25^{\circ}\text{C}$)	-100		+100	ppm	Option "blank"; See options
Equivalent series resistance (R1)			200	Ω	16.000 – 18.999MHz
			100		19.000 – 39.999MHz
			60		40.000 – 60.000MHz
Shunt capacitance (C0)			2.0	pF	
Load capacitance (CL)		8		pF	Option "blank"; See options
Drive Level			200	μW	
Aging	-3		+3	ppm	@ $25^{\circ}\text{C} \pm 3^{\circ}\text{C}$ First year
Insulation Resistance	500			M Ω	@100Vdc $\pm 15\text{V}$

Part Identification (left blank if standard)

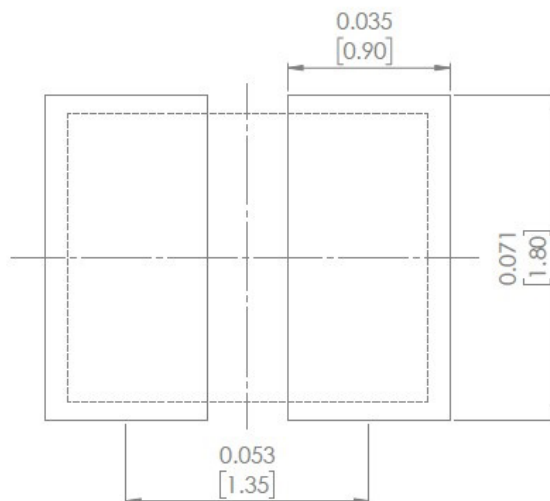


Mechanical Dimensions

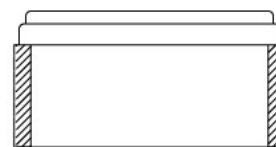
RECOMMENDED LAND PATTERN



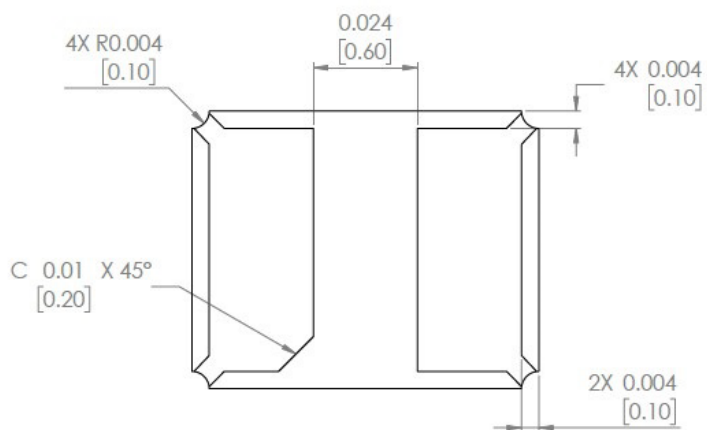
TOP VIEW



FRONT VIEW



SIDE VIEW



BOTTOM VIEW

Dimensions: inches [mm]

Reflow Profile [JEDEC J-STD-020]

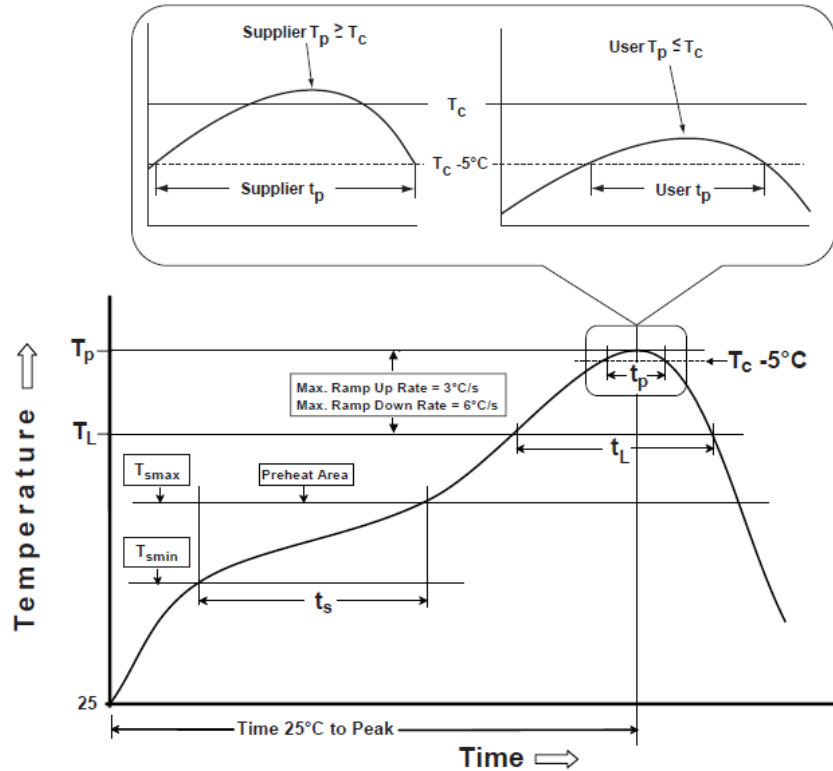


Table 1

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

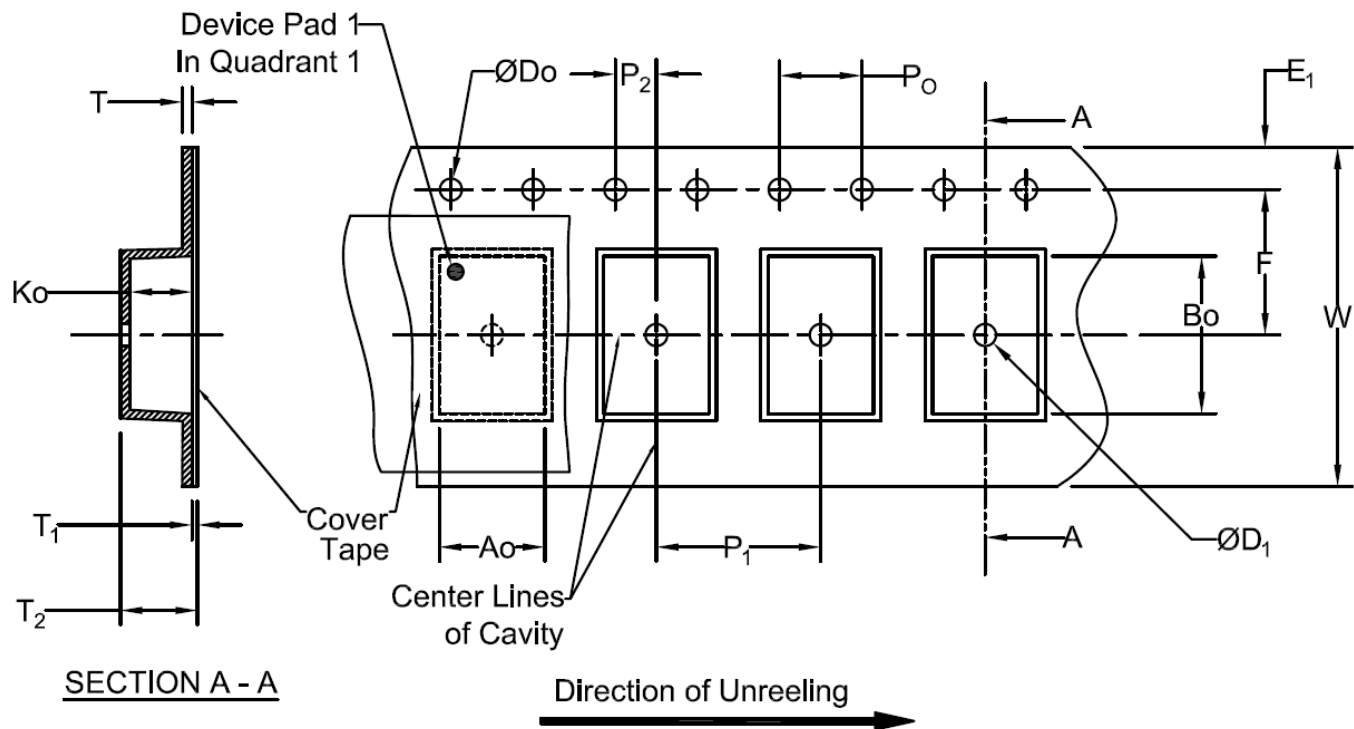
Pb-Free Process
Classification Temperatures (T_c)

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_{smx})	150°C	200°C
Time (T_{smin} to T_{smx}) (t_s)	60 - 120 sec.	60 - 120 sec.
Average ramp-up rate (T_{smx} 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_{smx})	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

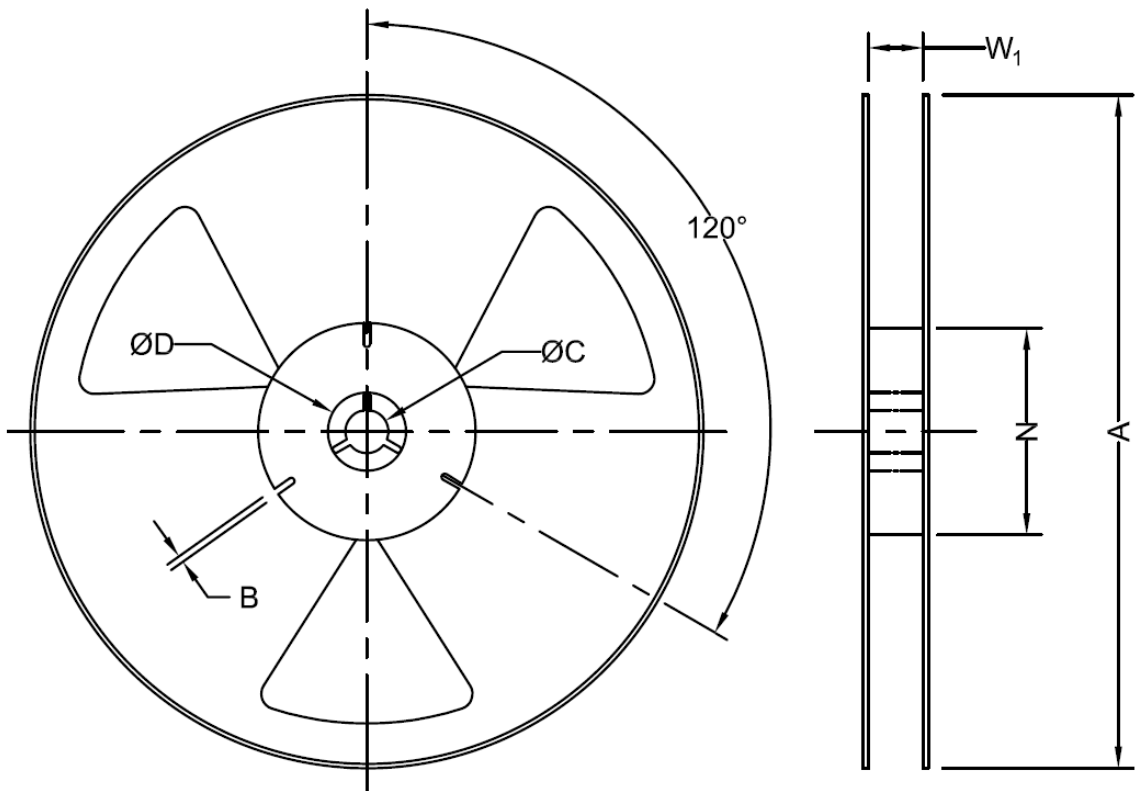
*Tolerance for peak profile temperature (T_p) is defined as a supplier minimum and a user maximum.**Tolerance for time at peak profile temperature (t_p) is defined as a supplier minimum and a user maximum.

Packaging



Tape Specifications (mm)							
Width	Ao	Bo	Do	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



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**