

# CERAMIC SMD CRYSTAL

ABMM2

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6.0 x 3.6 x 1.2 mm  
RoHS/RoHS II Compliant  
MSL Level = N/A

## Features

- Suitable for RoHS compliant reflow
- Seam sealed ceramic package assures high reliability
- Available tight tolerance and stability

## Applications

- Computers, Modems, Microprocessors
- Communication, Test equipment

## Key Electrical Specifications

Parameters	Min.	Typ.	Max.	Units	Notes
Frequency Range	7.3728		100.000	MHz	
Operation Mode	7.3728 – 30.000MHz	Fundamental			Standard
	30.001 – 100.000MHz	3 <sup>rd</sup> Overtone			Standard
	30.001 – 50.000MHz	Fundamental			See options
Operating Temperature	-10		+60	°C	See options
Storage Temperature	-40		+85	°C	
Frequency Tolerance @ +25°C	-20		+20	ppm	See options
Frequency Stability over the Operating Temperature ( ref. to +25°C)	-20		+20	ppm	See options
Equivalent series resistance (ESR)	See table 1 below			Ω	
Shunt capacitance (C0)			7.0	pF	
Load capacitance (CL)		18.0		pF	Standard (See options if other than STD)
Drive Level		100	500	μW	
Aging	-2		+2	ppm	@25°C±3°C First year
Insulation Resistance	500			MΩ	@ 100Vdc ± 15V

### Standard ESR

Frequency (MHz)	ESR(Ω) max
7.3728 – 7.999 (Fund)	140
8.000 – 10.000 (Fund)	72
10.001 – 20.000 (Fund)	50
20.001 – 50.000 (Fund)	40
30.001 – 47.999 (3 <sup>rd</sup> OT)	60
48.000 – 100.000 (3 <sup>rd</sup> OT)	80



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## Options and Part Identification (left blank if standard)

ABMM2- MHz -  -  -  -  -

### Frequency in MHz

Please specify the  
Frequency in MHz  
e.g. 16.000MHz

### Load Capacitance (pF)

Please specify CL in pF  
(8 to 33pF) or S for series  
Please contact Abracon  
for other values

### Custom ESR if other than standard

R□  
□: Specify a value in  
Ω (e.g.: R40)

### Freq. Tolerance

1: ± 10 ppm  
7: ± 15 ppm

### Packaging

Blank: Bulk  
T: 1000pcs / reel  
T2: 250pcs / reel

### Oscillation Mode

Blank: Standard mode  
F: Fundamental AT for  
Frequencies > 30.000MHz

### Frequency Stability (ppm)

Operating Temp.	±10	±15	±20	±30	±50	±100
0°C ~ +50°C	A3	-	A4	A6	-	-
-10°C ~ +50°C	B3	-	B4	B6	-	-
-10°C ~ +60°C	C1	C2	Std	C6	-	-
-20°C ~ +70°C	E1	-	E2	E6	-	-
-40°C ~ +85°C	-	-	D1	D6	D5	-
-40°C ~ +105°C	-	-	-	-	J5	J10
-40°C ~ +125°C	-	-	-	-	K5	K10



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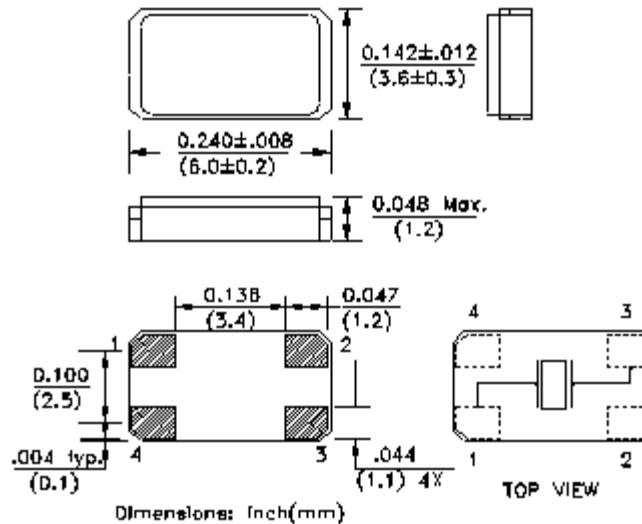


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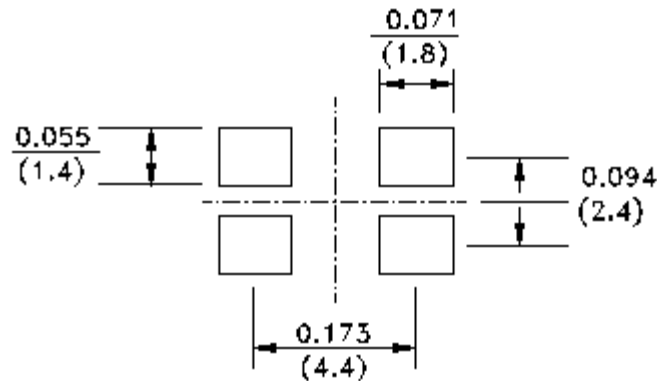


6.0 x 3.6 x 1.2 mm  
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## Mechanical Dimensions



### Recommended land pattern



Note 1: A chamfer of 0.3mm may appear on pad 1 or 4

Note 2: A rounded pad may appear on pad 1

Note 3: Pin 2 and 4 are connected to the metal lid.

Please connect to GND.

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## Reflow Profile [JEDEC J-STD-020]

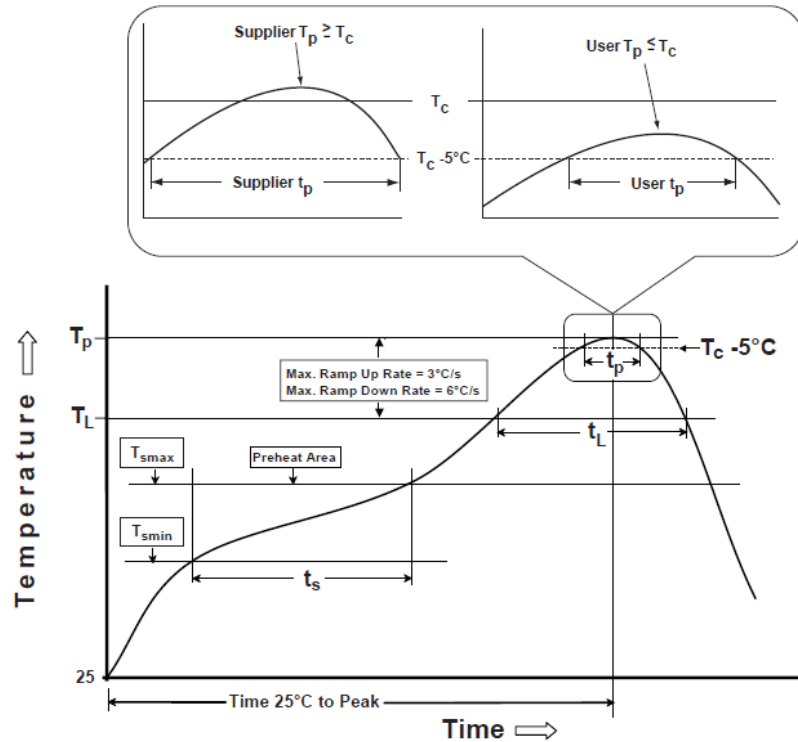


Table 1

### SnPb Eutectic Process Classification Temperatures ( $T_c$ )

Package Thickness	Volume mm <sup>3</sup> <350	Volume mm <sup>3</sup> ≥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 <sup>3</sup> <350	Volume mm <sup>3</sup> 350-2000	Volume mm <sup>3</sup> >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.



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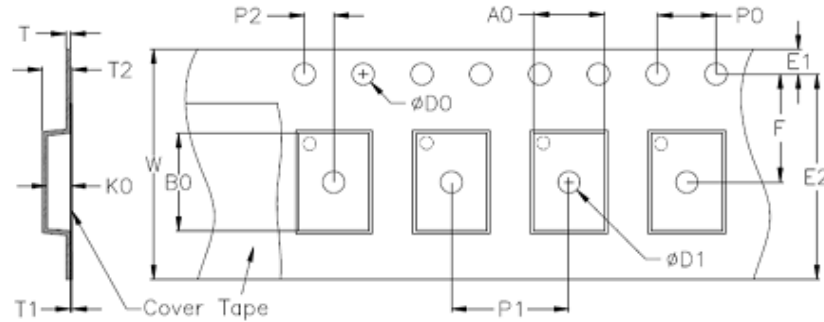
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## Packing

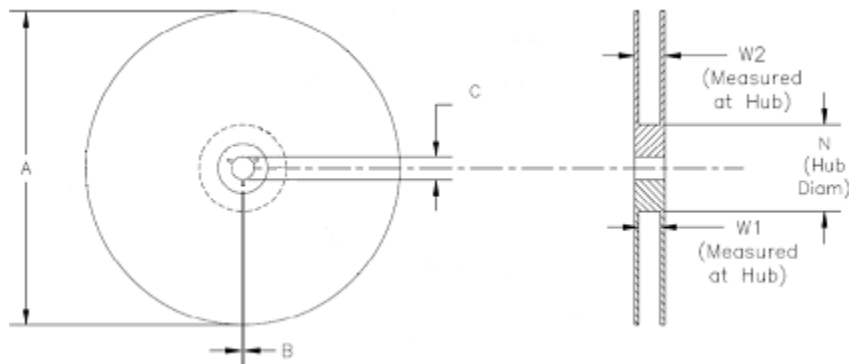
T: Tape and reel (1,000pcs/reel)

T2: Tape and reel (250pcs/reel)



Tape Size	W max.	D0	D1 min.	E1	F	P0	P1	P2
16mm	16.0±0.3	1.5	1.5	1.75±0.1	7.5±0.1	4.0±0.1	8.0±0.1	2.0±0.1
12mm	12.0±0.2				5.5±0.05			

Tape Size	T	T2 max.	B0	K0
16mm	0.3±0.05	1.5±0.1	6.4±0.1	1.5±0.1
12mm		1.8±0.1		1.8±0.1



Tape Size	A max.	B min.	C	N	W1	W2 max.
16mm	178±1	2.5±0.5	13.2±0.5	80.0	17.5±0.2	21.0±2.0
12mm				60.2±0.5	13.0±0.3	16±1.4

**Dimensions: mm**

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