

# Low Frequency SMD Microprocessor Crystal

ABC2 Series

Request Samples



Check Inventory



11.8 x 5.5 x 1.9 mm

RoHS RoHS II Compliant

MSL Level = N/A



## Features

- Low frequency in small size SMD
- 1.9mm height ideal for high density circuit boards
- Ceramic package offers excellent environmental & heat resistance
- Extended temperature -40°C to +85°C for industrial applications
- Suitable for RoHS compliant reflow

## Applications

- Wide range in communication & measuring equipment
- Commercial & Industrial applications

## Key Electrical Specifications

Parameters	Minimum	Typical	Maximum	Units	Notes
Frequency Range	3.200		30.000	MHz	Fundamental, AT
Operation Mode	Fundamental				
Operating Temperature	-10		+60	°C	Please see available options under Part Identification section
Storage Temperature	-55		+125	°C	
Frequency Tolerance @+25°C	-50		+50	ppm	See options
Frequency Stability over the Operating Temperature (ref. to +25°C)	-50		+50	ppm	Standard for below 6.0MHz (-10 °C to +60 °C) See options for other temperature Standard for 6.0MHz and above; (-10 °C to +60 °C) See options for other temperature
	-30		+30		
Equivalent series resistance (R1)	See table 1 below			Ω	
Shunt capacitance (C0)			7	pF	
Load capacitance (CL)		18		pF	See options
Drive Level			100	μW	
Aging@25°C±3°C			±5	ppm	First year
Insulation Resistance	500			M Ω	@ 100Vdc ± 15V



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## Table

Frequency Ranges	Operation mode	ESR (max)
3.200MHz ~ 3.499MHz	Fundamental	200 Ω
3.500MHz ~ 3.999MHz	Fundamental	140 Ω
4.000MHz ~ 4.399MHz	Fundamental	120 Ω
4.400MHz ~ 4.899MHz	Fundamental	100 Ω
4.900MHz ~ 5.999MHz	Fundamental	80 Ω
6.000MHz ~ 6.999MHz	Fundamental	60 Ω
7.000MHz ~ 7.999MHz	Fundamental	50 Ω
8.000MHz ~ 10.999MHz	Fundamental	45 Ω
11.000MHz ~ 11.999MHz	Fundamental	40 Ω
12.000MHz ~ 14.999MHz	Fundamental	35 Ω
15.000MHz ~ 30.000MHz	Fundamental	30 Ω

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

ABC2- MHz -  -  -  -  -  -

**Frequency in MHz**  
 Please specify the frequency in MHz  
 e.g. 14.31818MHz

**Packaging**  
 Blank: Bulk  
 T: Tape & Reel (1k pcs /reel)  
 T2: Tape & Reel (2k pcs /reel)

**Load Capacitance (pF)**  
 Please specify CL in pF or S for series

**Freq. Stability**  
 Blank: Standard  
 Y: ± 30 ppm  
 Z: ± 50 ppm  
 Q: ± 100 ppm

**Custom ESR if other than standard**  
 R  
: Specify a value in Ω (e.g.: R40)

**Operating Temp.**  
 Blank: -10°C ~ +60°C  
 B: -20°C ~ +70°C  
 D\*\*: -40°C ~ +85°C

**Freq. Tolerance**  
 Blank: ± 50 ppm  
 2: ± 20 ppm  
 4: ± 30 ppm

\*\*Option Q only for F≥6.0MHz; Option Z and Q only for F<6.0MHz



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

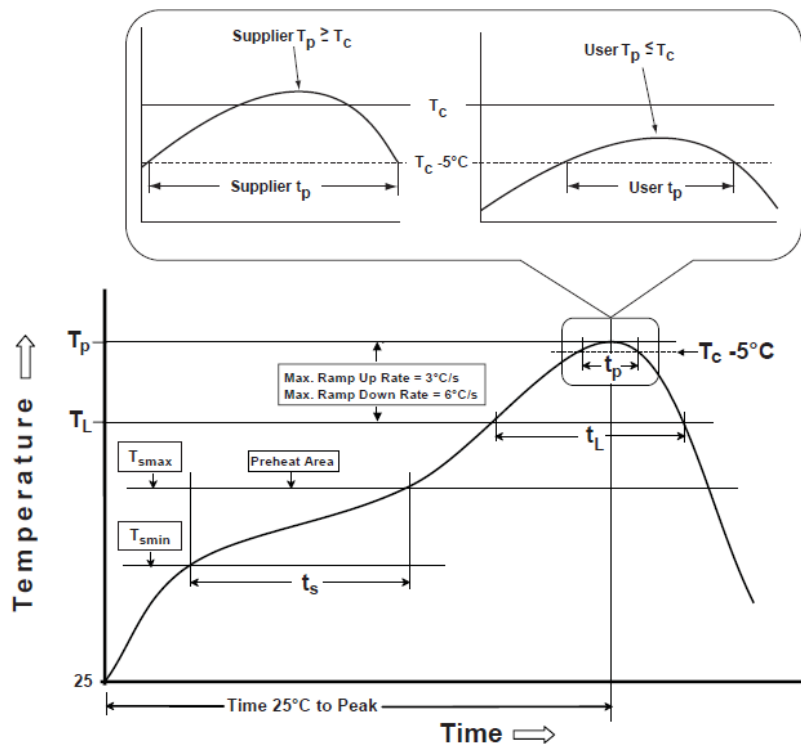


Table 1

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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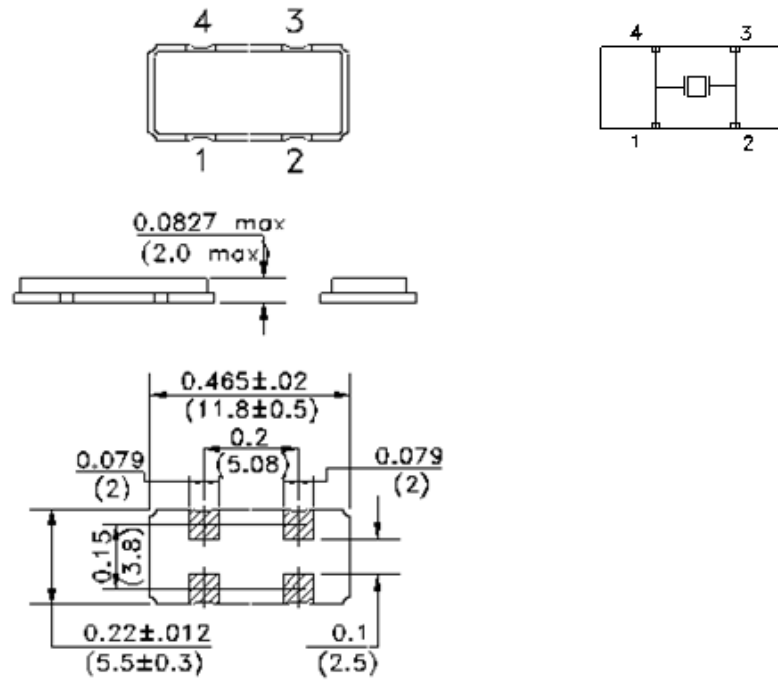
Check Inventory



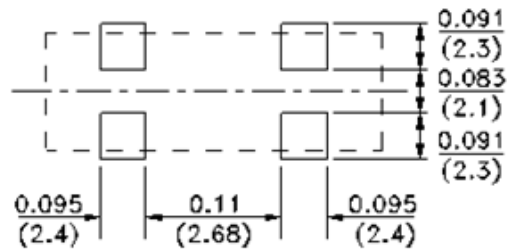
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## Mechanical Dimensions



## RECOMMENDED LAND PATTERN



Sealing Method = Glass Sealing

Dimensions: inches (mm)



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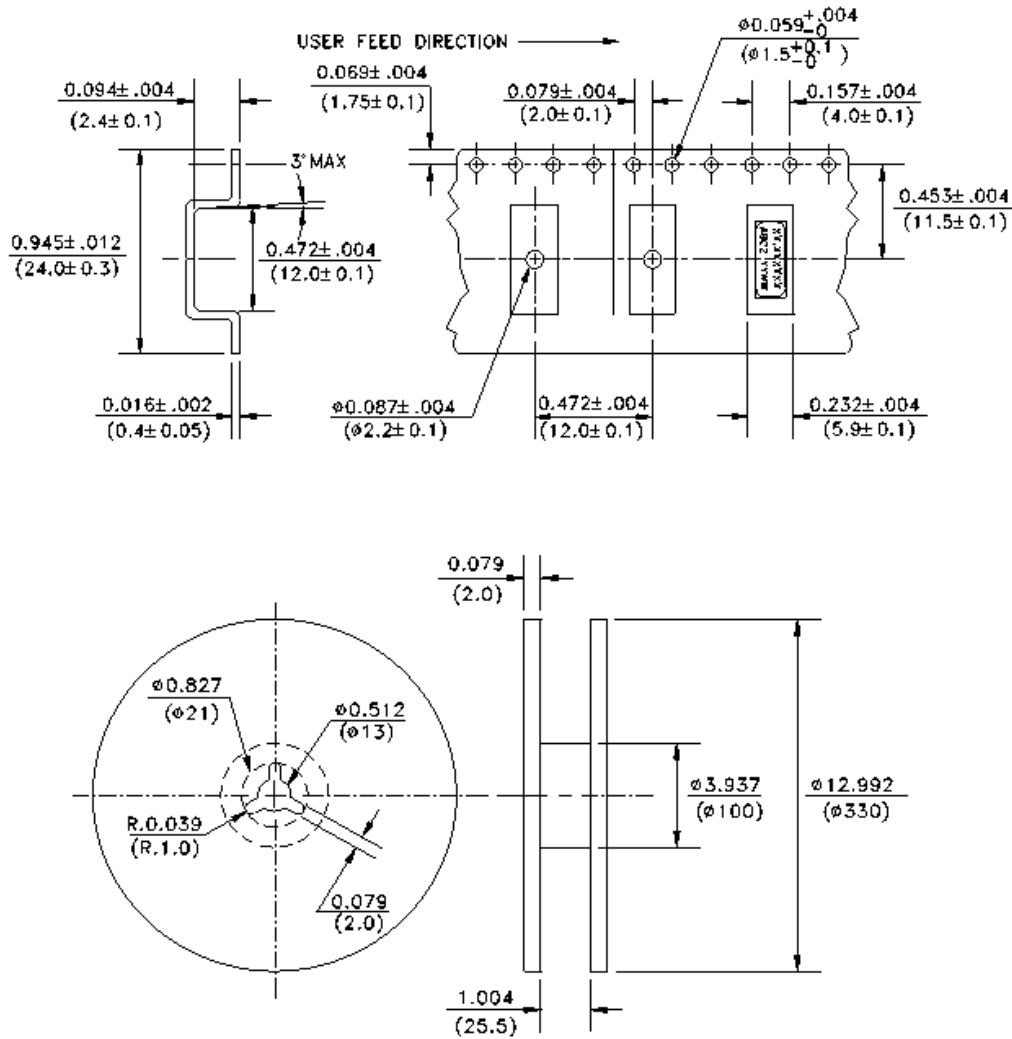


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## Packaging:

T: 1,000 pcs/reel  
 T2: 2,000 pcs/reel



Dimensions: mm

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