

CX532A  
5.0 x 3.2 x 0.8 mm  
Ceramic Package

## Features

- Miniature low profile surface mount crystal.
- Package is ideal for automated surface mount assembly and reflow practices.
- Tape and Reel Packaging.
- AT Cut Crystal
- 8 MHz to 80 MHz

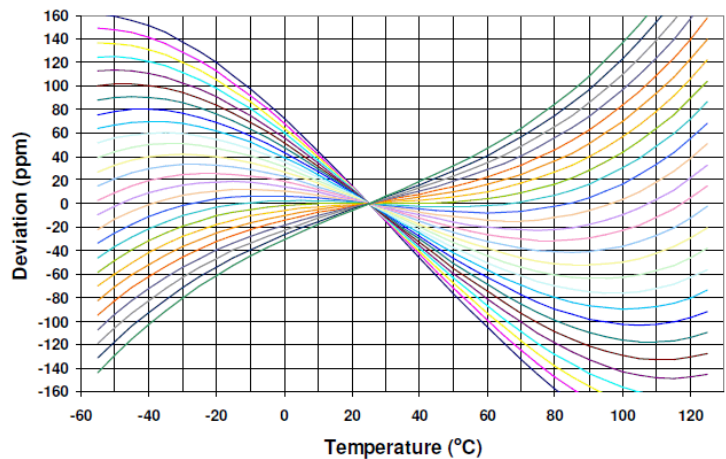
## Applications

Bluetooth  
WLAN  
IoT

## Electrical Characteristics

Parameter	Min	Typ	Max	Unit	Condition (Consult factory for other options)
Frequency Range	8.0	-	80	MHz	
Calibration Frequency Tolerance	±30	-	±100	ppm	at +25°C ± 3°C, see part number guide below for available options
Frequency Stability	±30	-	±100	ppm	see part number guide below for available options
Operating Temperature Range	-40	-	+85	°C	see part number guide below for available options
Storage Temperature Range	-55	-	+125	°C	
Equivalent Series Resistance (ESR)	-	-	100 65 60 55 50 45 40 60	Ω	8 MHz ≤ Freq < 11 MHz 11 MHz ≤ Freq < 12 MHz 12 MHz ≤ Freq ≤ 13 MHz 13 MHz < Freq ≤ 16 MHz 16 MHz ≤ Freq < 24 MHz 24 MHz ≤ Freq < 48 MHz 48 MHz ≤ Freq ≤ 53.125 MHz Freq = 80MHz
Drive Level	-	-	100	μW	Use 10μW for testing
Shunt Capacitance (C0)	-	-	5.0	pF	Pad to Pad Capacitance
Aging at 25°C ± 3°C	-	-	±5	ppm	for the first year
	-	-	±2	ppm	after the first year

## AT Cut Crystal Frequency versus Temperature Typical Performance:



**Part Numbering (Example: CX532AZ-A1B3C2-45-25.0D18)**

Series Model	Packaging		Operating Temperature Range	Frequency Stability (ppm)	Frequency Tolerance (ppm)		ESR ( $\Omega$ )		Frequency (MHz)	Load Capacitance	Overtone
CX532A	Z	-	A1	B3	C2	-	45	-	25.0	D18	
	Blank=Tape only Z = Tape/Reel		A0 = -10 ~ +60°C A4 = 0 ~ +70°C <b>A1 = -10 ~ +70°C</b> A5 = -20 ~ +70°C A2 = -40 ~ +85°C	B1 = $\pm 100$ B2 = $\pm 50$ <b>B3 = <math>\pm 30</math></b>	C1 = $\pm 100$ <b>C2 = <math>\pm 50</math></b> C3 = $\pm 30$		See ESR Table			D8 = 8 pF D10 = 10 pF D12 = 12 pF D16 = 16 pF <b>D18 = 18 pF</b> D20 = 20 pF DS = Series	Blank=Fund 3=3rd OT
										Standard loads, others available, check with sales for your requirement	

**Available Frequency Stability versus Temperature in ppm**

		B3	B2	B1
		$\pm 30$	$\pm 50$	$\pm 100$
0 to +70°C	<b>A4</b>	•	•	•
-10 to +60°C	<b>A0</b>	•	•	•
-10 to +70°C	<b>A1</b>	•	•	•
-20 to +70°C	<b>A5</b>	•	•	•
-40 to +85°C	<b>A2</b>	•	•	•

• = Available Note: Not every combination of frequency/tolerance/stability/load capacitance may be available

**Reliability**

Parameter	Condition
Mechanical Shock	MIL-STD-883, Method 2002, Condition B
Vibration	MIL-STD-883, Method 2007, Condition A
Solderability	IPC J-STD-002
Thermal Cycle	MIL-STD-883 Method 1010, Condition B

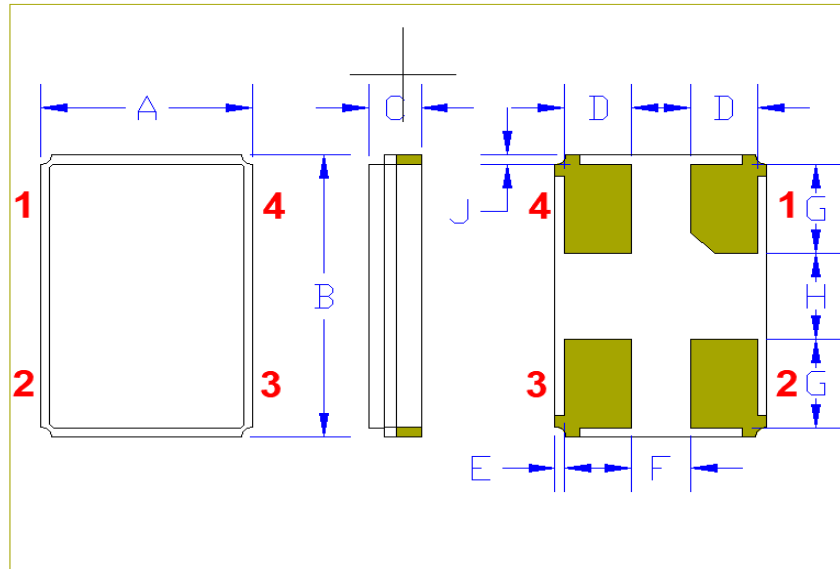
**Cardinal Components Inc. certifies this device is in accordance with the RoHS and REACH directives.**

Cardinal guarantees the device does not contain the following: Cadmium, Hexavalent Chromium, Lead, Mercury, PBB's, PBDE's  
 Weight of the Device: 0.042 grams  
 Moisture Sensitivity Level: 1 As defined in J-STD-020D  
 Second Level Interconnect code: e4

## Mechanical Dimensions

	Inches	mm
A	0.126 ± 0.004	3.2 ± 0.1
B	0.197 ± 0.004	5.0 ± 0.1
C	0.039 max	1.0 max
D	0.031	0.8
E <sup>1</sup>	0.004	0.1
F <sup>1</sup>	0.055	1.4
G <sup>1</sup>	0.043	1.1
H <sup>1</sup>	0.102	2.6
J <sup>1</sup>	0.004	0.1

<sup>1</sup> Typical dimensions

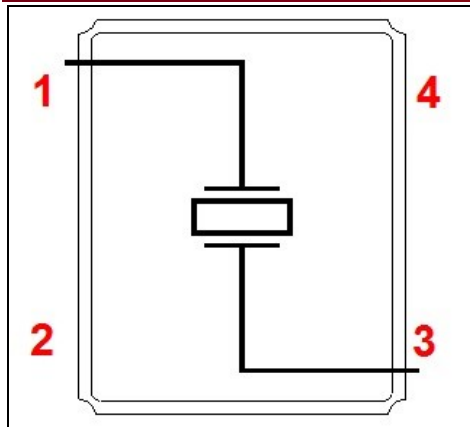


Contacts (pads): Gold (0.3 to 1µm) over Nickel (1.27 to 8.89 µm)

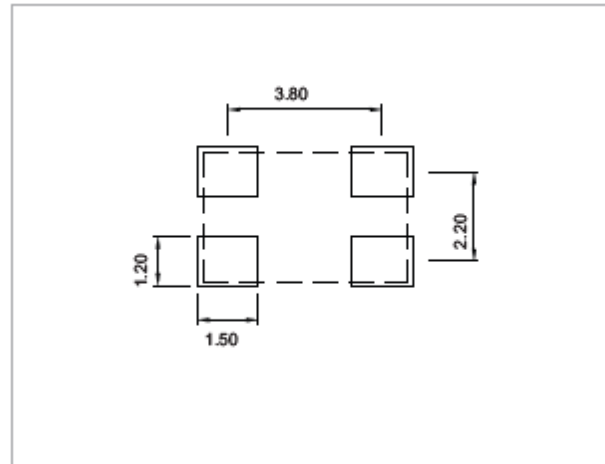
**The chamfered pad may or may not be present and may be on any pad.**

The crystal is symmetrical, there is no Pad 1 preference. The part can be rotated 180° when being assembled on the PCB.

## Layout



## SOLDER PAD LAYOUT (mm)



### Pad Layout

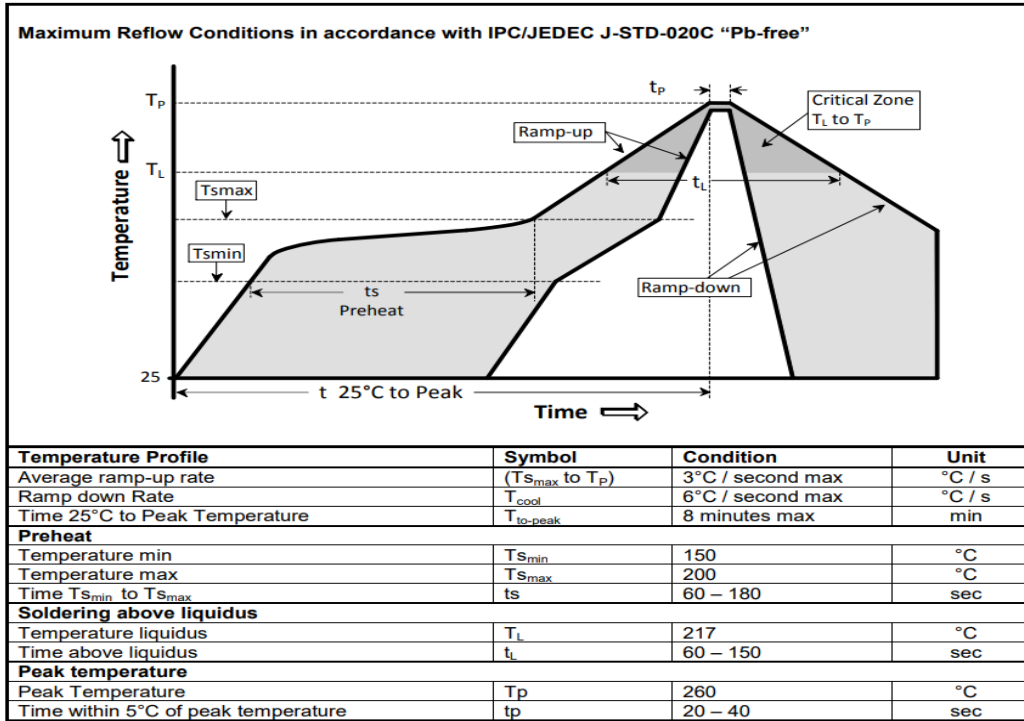
Disclaimer: Recommended layout shown. Adjust layout as needed for individual process requirements.

Pad	Note
2 + 4	Connected to the metal cover

For Optimum Jitter Performance, Cardinal recommends:

- Trace lengths to the crystal should be kept as short as possible.
- The crystal connections are sensitive to noise.
- The package should be grounded for optimum performance, pad 2 or 4 connected to ground.
- These small crystals have high ESR, the oscillator start-up and operation should take this into consideration.
- These small crystals should have their maximum drive level limited to 100 µW.

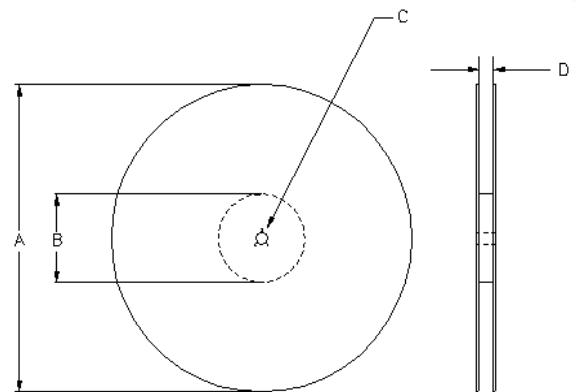
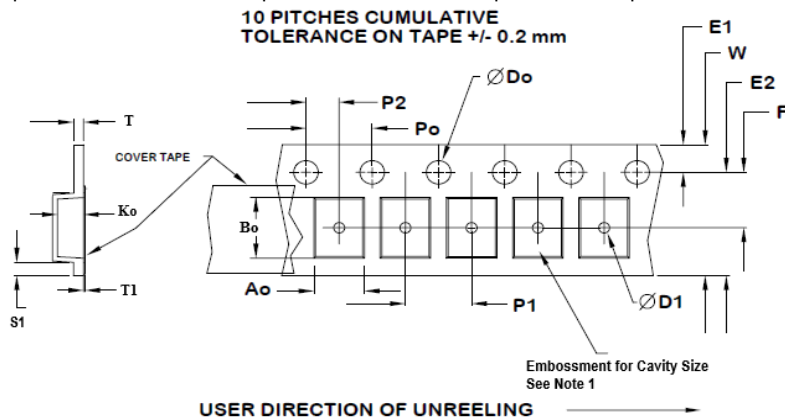
## Reflow Cycle



The part may be reflowed 2 times without degradation (typical for lead free processing).

## Tape and Reel

Tape and Reel available for quantities of 250 to 1000 per reel, cut tape for < 1000.



Tape Size	E2 typ	F	P1	W max	Ao	Bo	Ko
12mm	10.25	5.5 ±0.05	8.0 ±0.1	12.2	3.6±0.1	5.4±0.1	1.4±0.1

Dimensions in mm Drawing Not to scale  
Note 1: Embossed cavity to conform to EIA-481-B

Reel Size	A		B		C	D
	Inches	mm	Inches	mm		
7	7.0	177.8	2.50	63.5	13.0 +0.5 -0.2	Tape size +0.4 +2.0 -0.0
10	10.0	254.0	4.00	101.6		
13	13.0	330.2	3.75	95.3		

Tape Size	Do	D1 min	E1	Po	P2	S1 min	T max	T1 max
12mm	1.5 +0.1 -0.0	1.5	1.75 ±0.1	4.0 ±0.1	2.0 ±0.05	0.6	0.3	0.1



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