

**RoHS Compliant  
Pb - Lead Free**

Ltr	Revisions	Date	Appr

**Electrical Specifications:**

<b>Frequency Range</b>		<b>3.200 to 70.000</b>	<b>MHz</b>
<b>Mode of Oscillation</b>	<b>Fundamental</b>	<b>3.200 to 32.768</b>	<b>MHZ</b>
	<b>Third Overtone</b>	<b>24.576 to 70.000</b>	
<b>Frequency Tolerance at 25°C</b>	<b>Standard</b>	<b>±30</b>	<b>PPM Max</b>
	<b>Optional</b>	<b>±25</b>	
		<b>±20</b>	
		<b>±15</b>	
		<b>±10</b>	
<b>Frequency Stability over Temperature Range</b>	<b>Standard</b>	<b>±50</b>	<b>PPM Max</b>
	<b>Optional</b>	<b>±30</b>	
		<b>±25</b>	
		<b>±20</b>	
		<b>±15</b>	
<b>Operating Temperature Range</b>	<b>Standard</b>	<b>-20 to +70</b>	<b>° C</b>
	<b>Extended</b>	<b>-40 to +85</b>	
<b>Storage Temperature Range</b>		<b>-55 to +125</b>	
<b>Aging</b>		<b>±5 first year ±3 thereafter</b>	<b>PPM Max/Year</b>
<b>Load Capacitance</b>		<b>10 to 32 and Series Resonance</b>	<b>pF</b>
<b>Shunt Capacitance</b>		<b>7.0</b>	<b>pF Max</b>
<b>Equivalent Series Resistance (ESR)</b>		<b>See ESR Table</b>	<b>Ohms</b>
<b>Drive Level</b>		<b>1.0</b>	<b>mW Max</b>
<b>Insulation Resistance</b>		<b>500 at 100 Vdc ± 15 Vdc</b>	<b>M Ohm</b>



11-3 Chien-Kuo Rd T.E.P.Z. 4027 Taiwan, ROC

All dimensions are millimeters.

CAD: TCR

Review: EG

Appr: JL

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Specification Title:

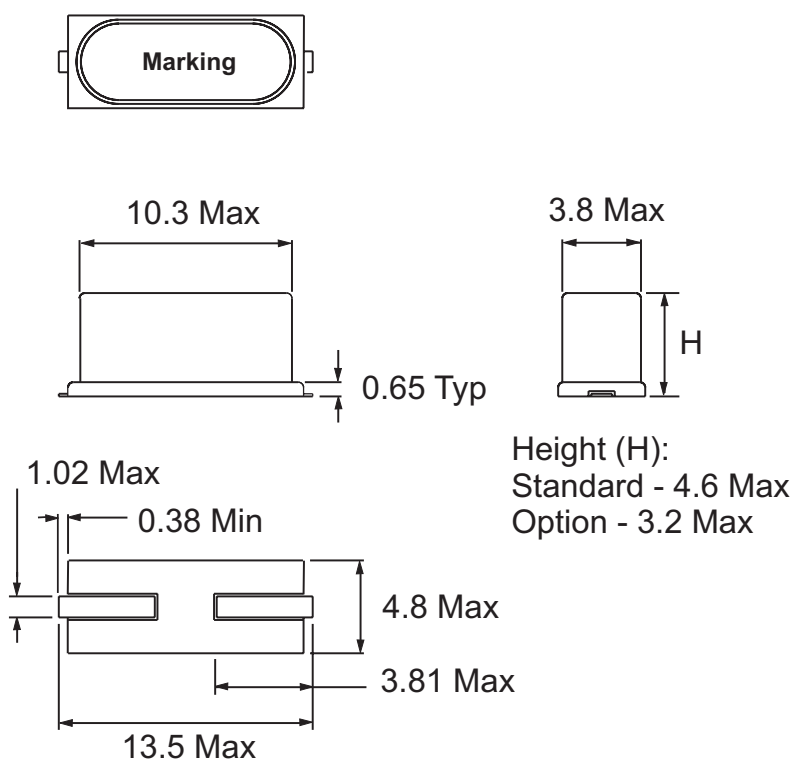
**Quartz Crystal  
Surface Mount  
HC-49/U-S SMD Package  
General Product Specification**

Part Number: **CAA Series**

### Frequency Range vs. ESR Values:

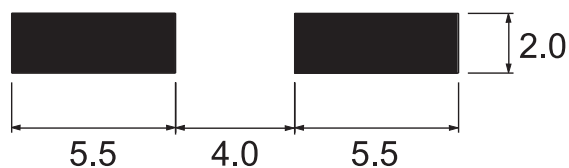
Frequency Range in MHz	ESR Ohms Max	Mode of Operation
3.200 to 3.500	300	Fundamental
3.510 to 3.999	200	Fundamental
4.000 to 5.999	120	Fundamental
6.000 to 7.999	80	Fundamental
8.000 to 9.999	60	Fundamental
10.000 to 15.999	50	Fundamental
16.000 to 32.768	40	Fundamental
24.576 to 70.000	80	Fundamental-Third Overtone

### Mechanical Outline:

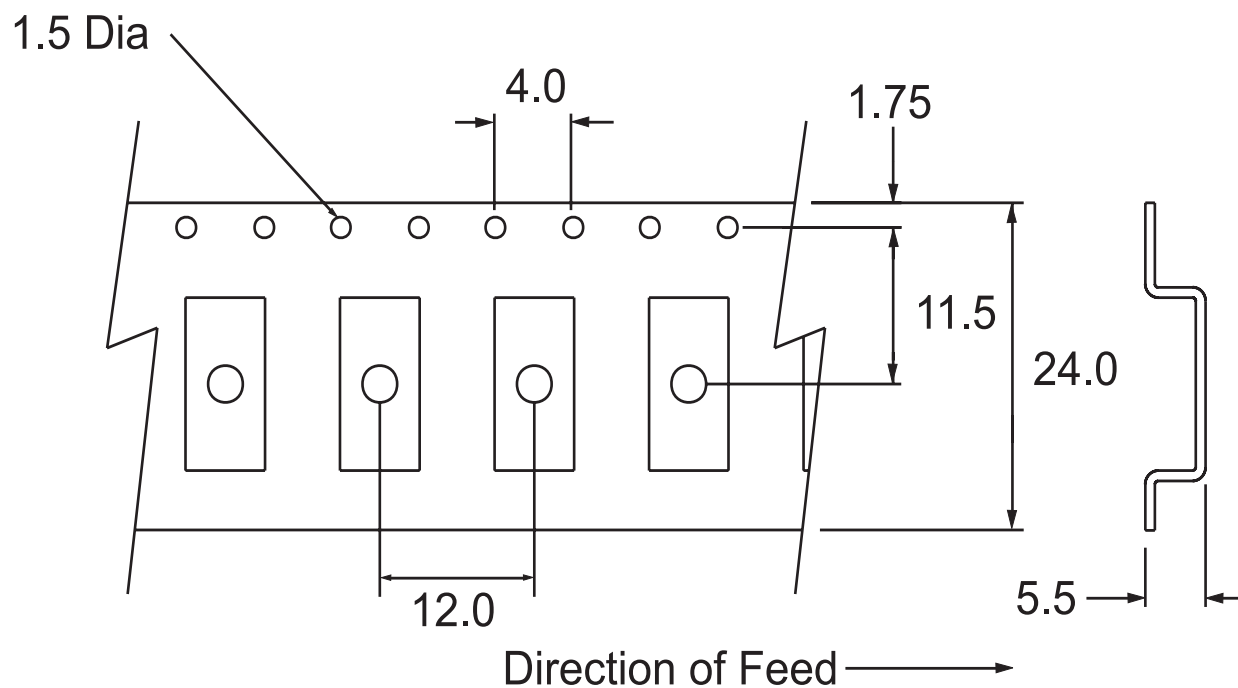


**Dimensions are millimeters.**

### PCB Solder Pad Layout:

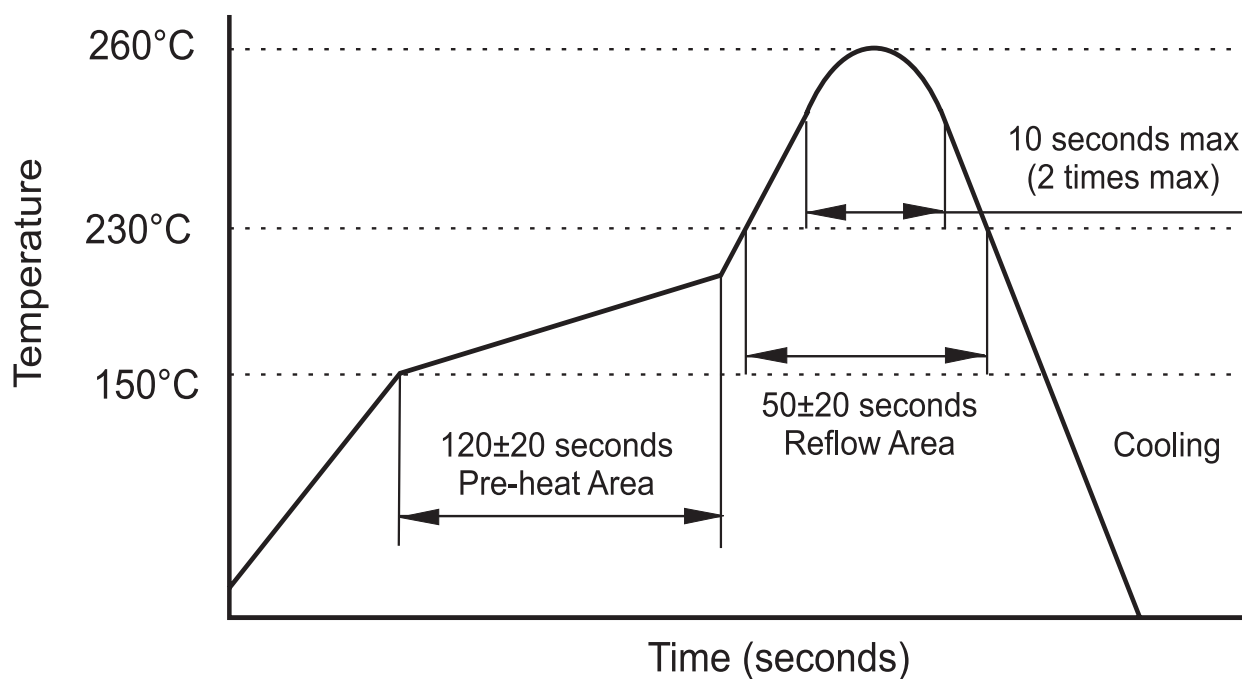


### Carrier Tape Dimensions:



Dimensions are millimeters.

### Solder Reflow Characteristics:



## How to build a Part Number:

Series		C	Parameter
Package		AA	HC-49/U-S SMD
		-	
Frequency		3.200 to 70.000	MHz
		-	
Load Capacitance		10	10 pF
		12	12 pF
		16	16 pF
		18	18 pF
		20	20 pF
		32	32 pF
		S	Series
		-	
Frequency Tolerance	Standard	30	±30 PPM
	Option	25	±25 PPM
		20	±20 PPM
		15	± 15 PPM
		10	±10 PPM
Frequency Stability	Standard	50	±50 PPM
	Option	30	±30 PPM
		25	±25 PPM
		20	±20 PPM
		15	±15 PPM
		10	±10 PPM
		-	
Mode of Oscillation		See Notes	Fundamental
		3	Third Overtone
		-	
Temperature Range	Standard	See Notes	-20 to +70 °C
	Option	X	-40 to +85 °C
		-	
Package Height	Standard	See Notes	4.6
	Option	32	3.2
		-	
Packaging		See Notes	Bulk
		R	Tape and Reel

### Part Number Example:

**CAA-24.000-18-3050-R**

**CAA: HC-49/U-S SMD Package**

**24.000 MHz Nominal Frequency**

**18pF Load Capacitance**

**3050: ±30 PPM Tolerance and ±50 PPM Stability**

**Fundamental Mode**

**-20 to +70°C Temperature Range**

**Standard Height - 4.6 mm**

**R: Tape and Reel Packaging**

### Notes:

- 1- Standard Temperature Range, Package Height (4.6mm), and Fundamental Mode do not need to be included in Part Number description.
- 2- Product is shipped in Tape and Reel configuration. Each reel contains 1000 pieces.
- 4- Quantities less than 1000 are shipped bulk. 100 pieces in ESD bags.
- 5- Specification subject to change without notice.

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