

**RoHS Compliant  
Pb - Lead Free**

Ltr	Revisions	Date	Appr

**Electrical Specifications:**

<b>Nominal Frequency</b>		<b>32.768</b>	<b>KHz</b>
<b>Frequency Tolerance at 25° C</b>	<b>Standard</b>	<b>±20</b>	<b>PPM</b>
	<b>Optional</b>	<b>±15</b>	
<b>Aging</b>		<b>±3 (first year)</b>	
<b>Turnover Temperature</b>		<b>25 ±5</b>	<b>° C</b>
<b>Temperature Coefficient</b>		<b>-0.035 ± 0.008 PPM/Δ °C<sup>2</sup></b>	
<b>Temperature Range (Operating)</b>	<b>Standard</b>	<b>-10 to +60</b>	
	<b>Optional</b>	<b>-40 to +85</b>	
<b>Temperature Range (Storage)</b>		<b>-55 to +125</b>	
<b>Equivalent Series Resistance</b>		<b>50</b>	<b>K Ohm Max</b>
<b>Load Capacitance</b>	<b>Standard</b>	<b>12.5</b>	<b>pF</b>
	<b>Optional</b>	<b>6.0</b>	
<b>Shunt Capacitance</b>		<b>1.5</b>	<b>pF Typ</b>
<b>Motional Capacitance</b>		<b>3.0</b>	<b>fF Typ</b>
<b>Drive Level</b>		<b>1.0</b>	<b>uW Max</b>
<b>Insulation Resistance</b>		<b>500 at 100 Vdc ± 15 Vdc</b>	<b>M Ohm Min</b>
<b>Quality Factor</b>		<b>70000</b>	<b>Typ</b>
<b>Capacitance Ratio</b>		<b>450</b>	
<b>Resistance to Shock</b>		<b>±5 PPM maximum offset from 75 cm drop test in all axes on to a hard surface.</b>	<b>-</b>



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

All dimensions are millimeters.

CAD: TCR

Review: EG

Appr: JL

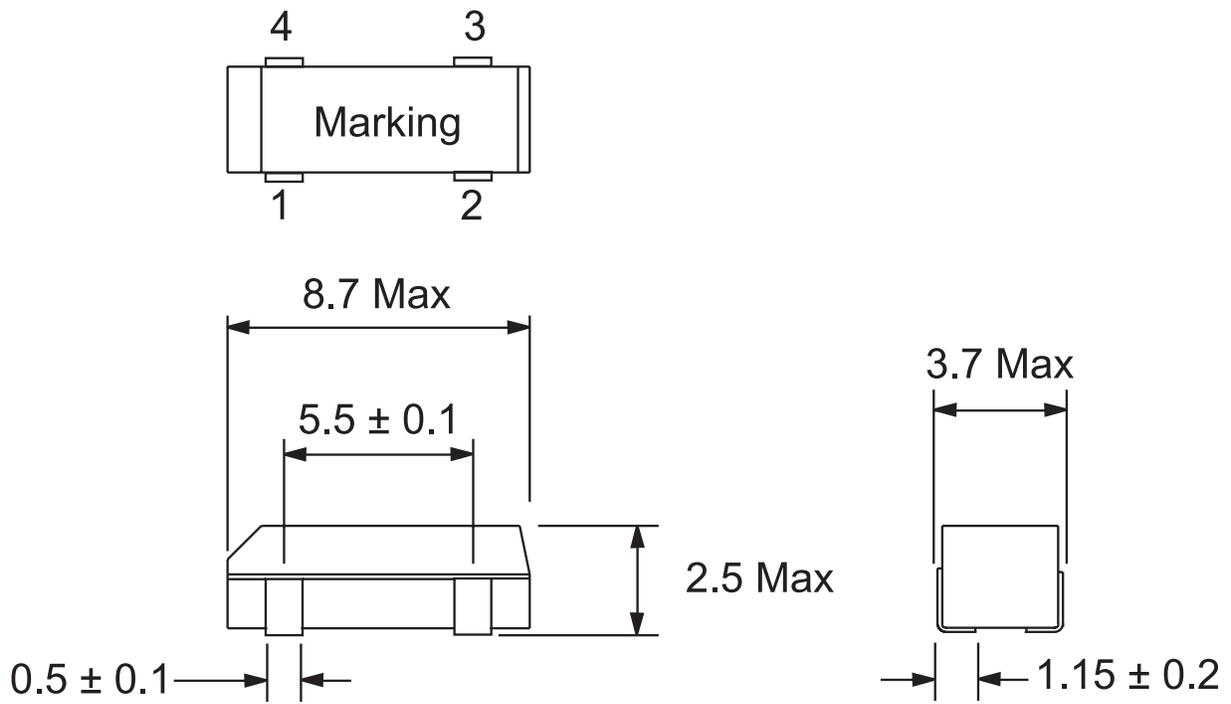
Page: 1/4 Date: June 10, 2006

**Specification Title:**

**Microprocessor Crystal Unit  
32.768 KHz  
3.8 x 8.0 millimeter Surface Mount  
Thermoplastic Package  
General Product Specification**

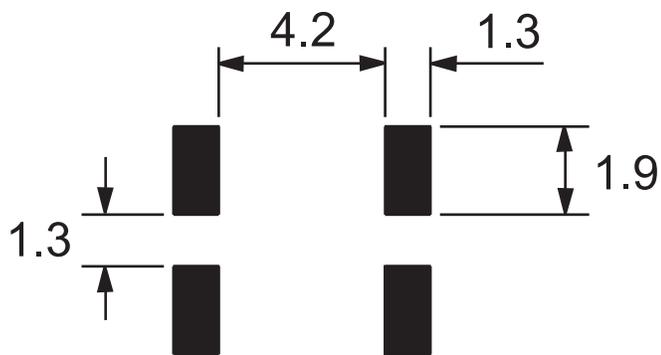
**Part Number: CTP3-32.768-12.5-20**

**Mechanical Outline:**

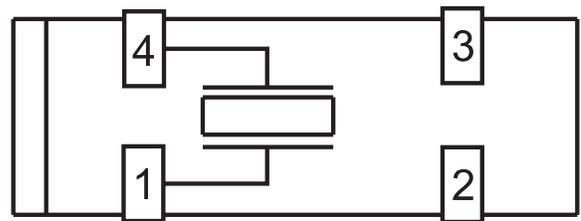


**Package is Thermoplastic.  
Dimensions are millimeters.**

**PCB Solder Pad Layout:**

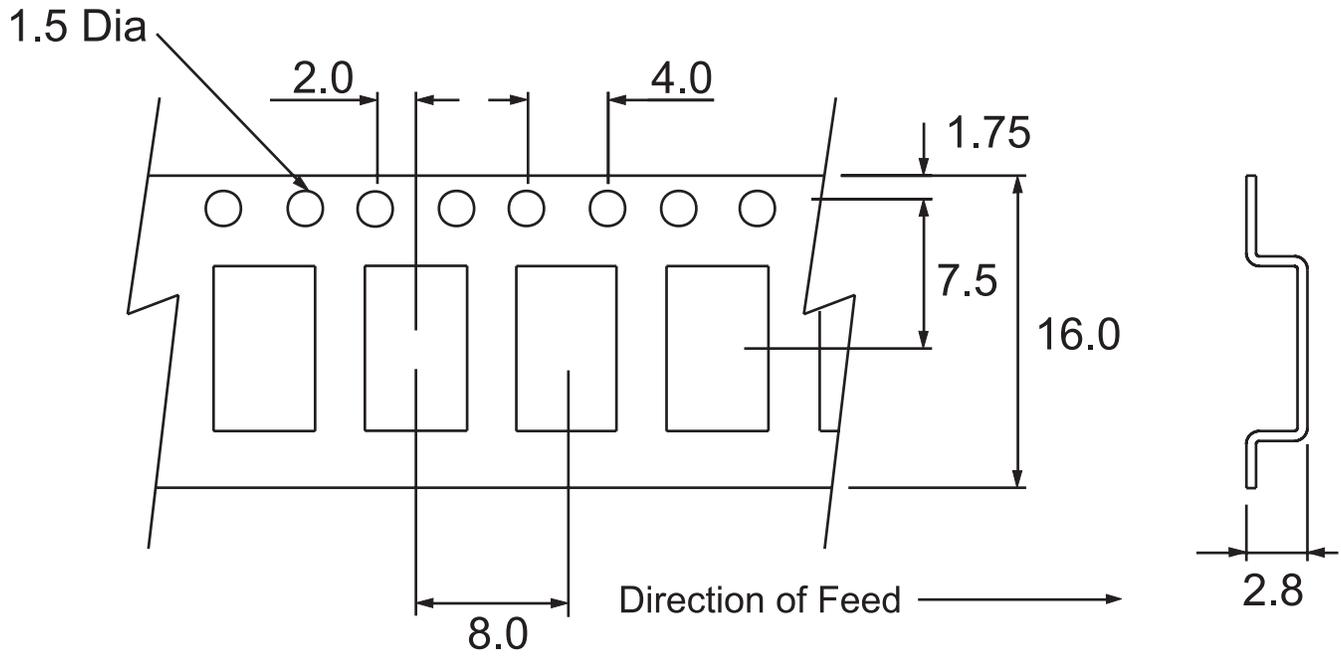


**Pad Connection:**



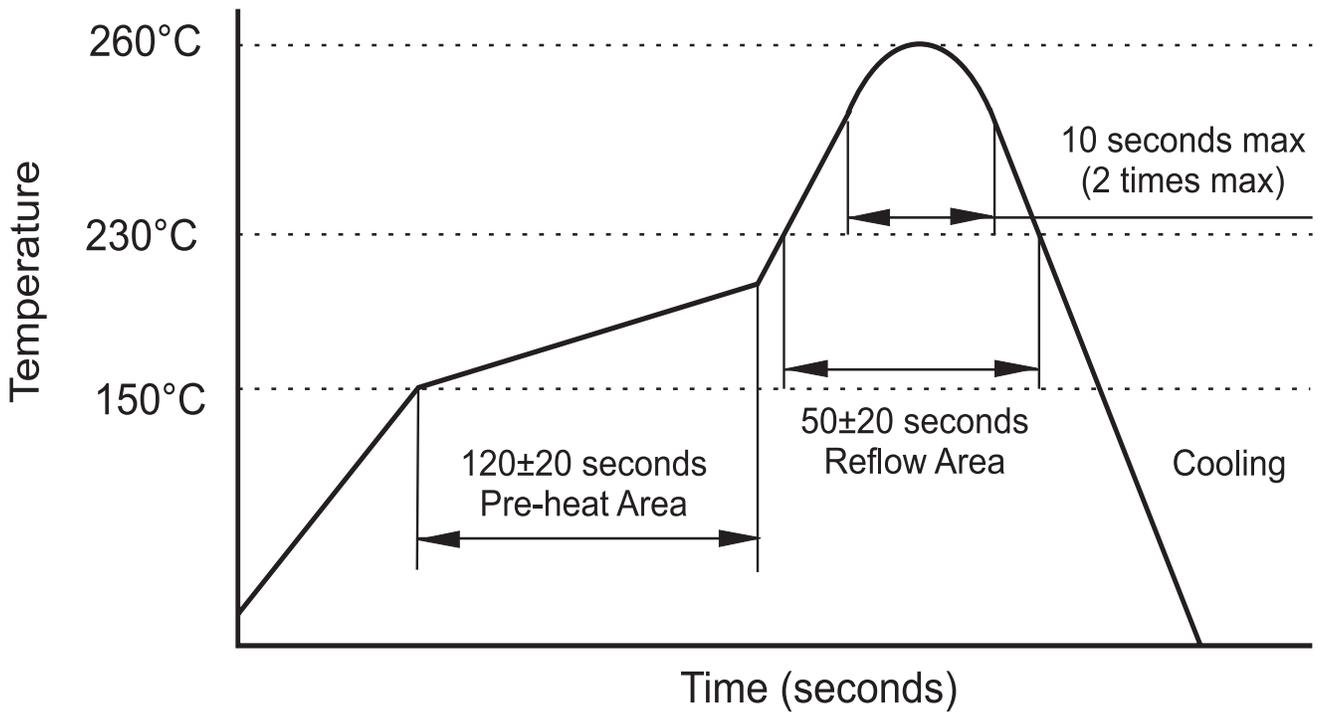
**Top View**

**Carrier Tape Dimensions:**



Dimensions are millimeters.

**Solder Reflow Characteristics:**



### How to build a Part Number:

Series		CTP	Parameter
Package		3	3.8 x 8.0 mm Thermoplastic SMD
		-	
Frequency		32.768	KHz
		-	
Load Capacitance	Standard	12.5	12.5 pF
	Option	6	6 pF
		-	
Frequency Tolerance	Standard	20	±20 PPM
	Option	15	±15 PPM
		-	
Temperature Range	Standard	See Notes	-10 to +60 °C
	Option	X	-40 to +85 °C
		-	
Packaging		R	Tape and Reel

### Part Number Example:

**CTP3-32.768-12.5-20-R**

**CTP3- 3.8 x 8.0 mm Thermoplastic SMD Package**

**32.768 KHz Nominal Frequency**

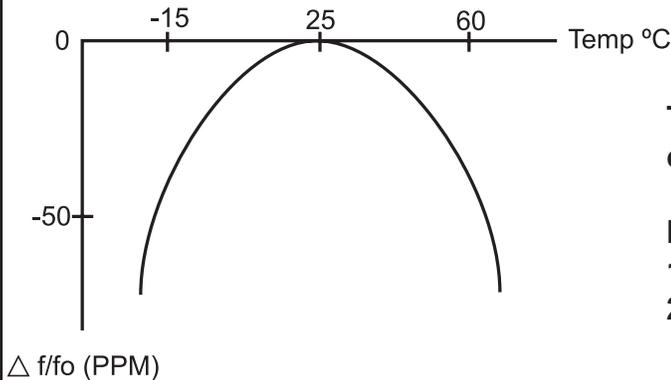
**12.5 pF Load Capacitance**

**20: ±20 PPM Frequency Tolerance**

**-10 to +60° C Temperature Range**

**R: Tape and Reel Packaging**

### Frequency vs. Temperature Characteristics:



To calculate the frequency stability the parabolic curvature constant (K) is needed.

For calculating the stability at 45 ° C?

1- Change in temperature ( $\Delta T$ ) is (45-25) = +20 ° C

2- Change in frequency is  $(-0.035 \times (\Delta ^\circ C)^2) = (-0.035 \times (20)^2) = -14 \text{ PPM}$

### Notes:

- 1- Standard Temperature Range does not need to be included in Part Number description.
- 2- Product is shipped in Tape and Reel configuration. Each reel contains 3000 pieces.
- 3- Quantities less than 3000 are shipped bulk in ESD pouches.
- 4- Specification subject to change without notice.