Ltr	Revisions	Date	Appr

Electrical Specifications:

Nominal Frequency		32.768	KHz
Frequency Tolerance at 25º C	Standard	±20	PPM
	Optional	±10	
Aging per year		±3	
Turnover Temperature		25 ±5	º C
Temperature Coefficient		-0.034 ± 0.008 PPM/$\triangle$ ºC²	
Temperature Range		-40 to +85	
Temperature Range (Extended)		-40 to +125	
Temperature Range (Storage)		-55 to +140	
Equivalent Series Resistance		70	K Ohm Max
Load Capacitance	Standard	12.5	pF
	Optional	6.0	
		7.0	
		9.0	
Shunt Capacitance		1.7	pF Typ
Motional Capacitance		3.0	fF Typ
Drive Level		1.0	uW Max
Insulation Resistance		500 at at 100 Vdc ± 15 Vdc	M Ohm Min
Quality Factor		70000	Typ
Capacitance Ratio		450	
Resistance to Shock		±5 PPM maximum offset from 75 cm drop test in all axes on to a hard surface.	-

AKER
Accurate Kinetic Energy

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

All dimensions are millimeters.

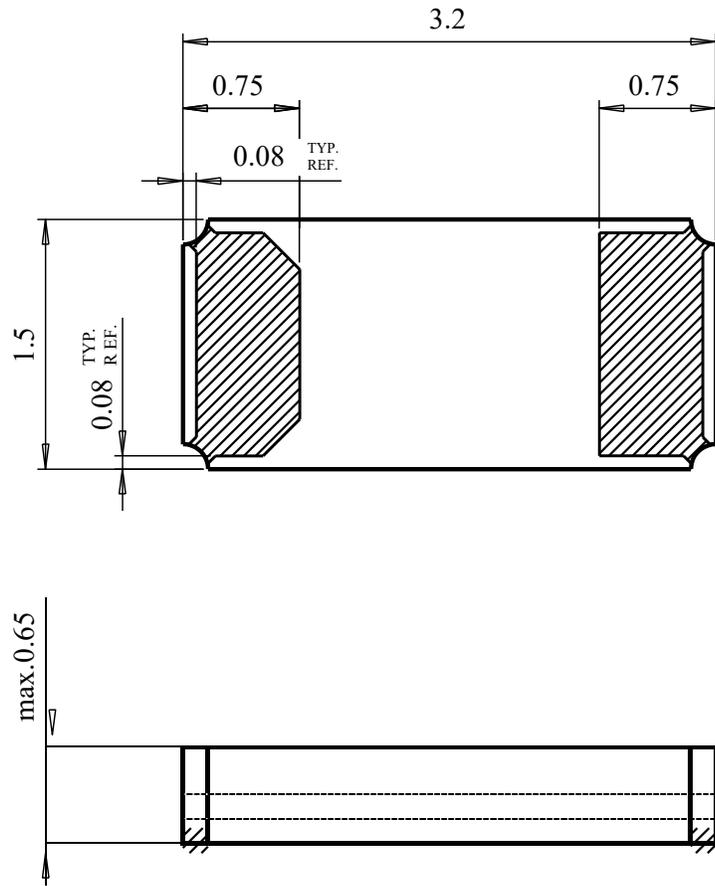| CAD:	TCR
Review:	EG
Appr:	JL
Page: 1/4	Date: Oct. 21, 2018

Specification Title:

Microprocessor Crystal Unit
32.768 KHz (Time of Day)
3.2 x 1.5 millimeter Surface Mount
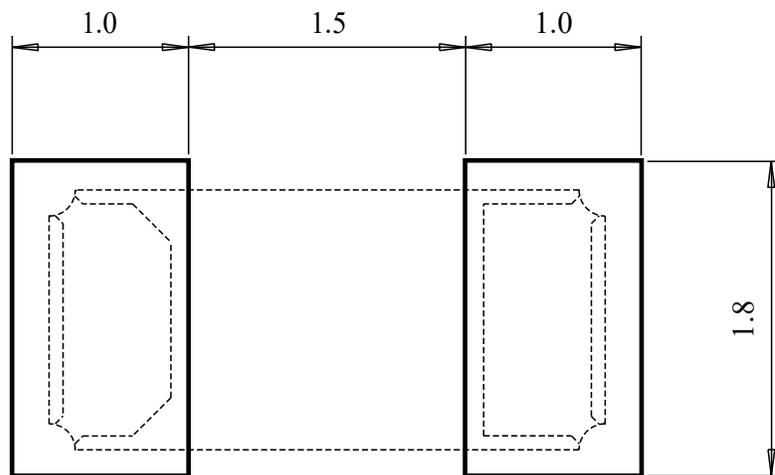**Ceramic Package**
General Product Specification

Part Number: **CTS3 Series**

Mechanical Outline:
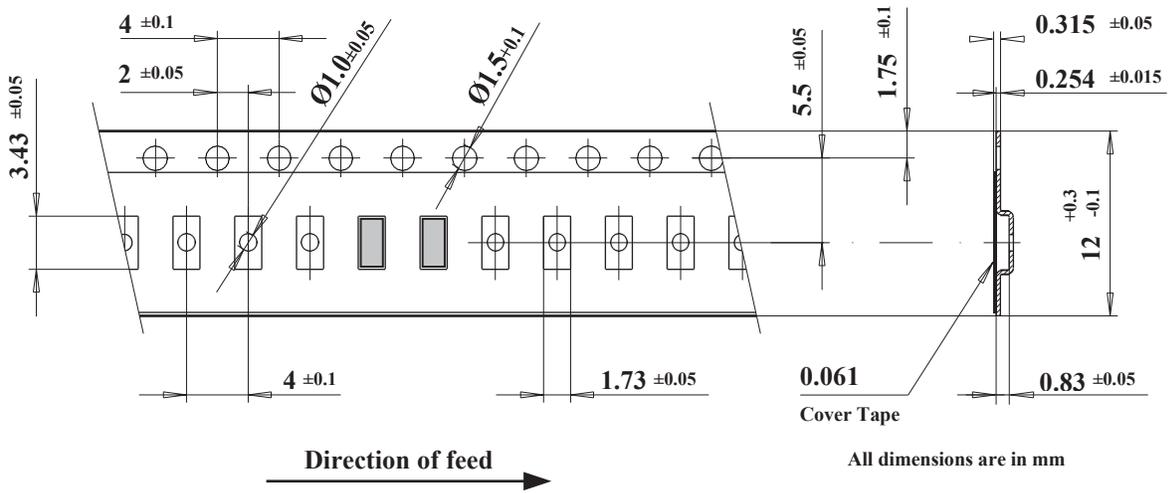
Tolerances: unless otherwise specified ± 0.1mm

3.2

0.75   0.75

0.08 TYP. REF.

1.5

0.08 TYP. REF.

max.0.65

Package is Ceramic-Metal.
Dimensions are millimeters.

PCB Solder Pad Layout:

1.0   1.5   1.0

1.8

| Page: | 2/4 | Date: | Oct. 21, 2018 | P/N: | **CTS3 Series** | |

Carrier Tape Dimensions:

4 ±0.1
2 ±0.05
Ø1.0±0.05
Ø1.5±0.1
5.5 ±0.05
1.75 ±0.1
0.315 ±0.05
0.254 ±0.015
3.43 ±0.05
12 +0.3 -0.1

4 ±0.1
1.73 ±0.05
0.061
Cover Tape
0.83 ±0.05

Direction of feed

All dimensions are in mm

Solder Reflow Characteristics:

Temperature

T_P

T_L

Tsmax

Tsmin

25

t_P

Ramp-up

Critical Zone T_L to T_P

t_L

ts
Preheat

Ramp-down

t 25°C to Peak

Time
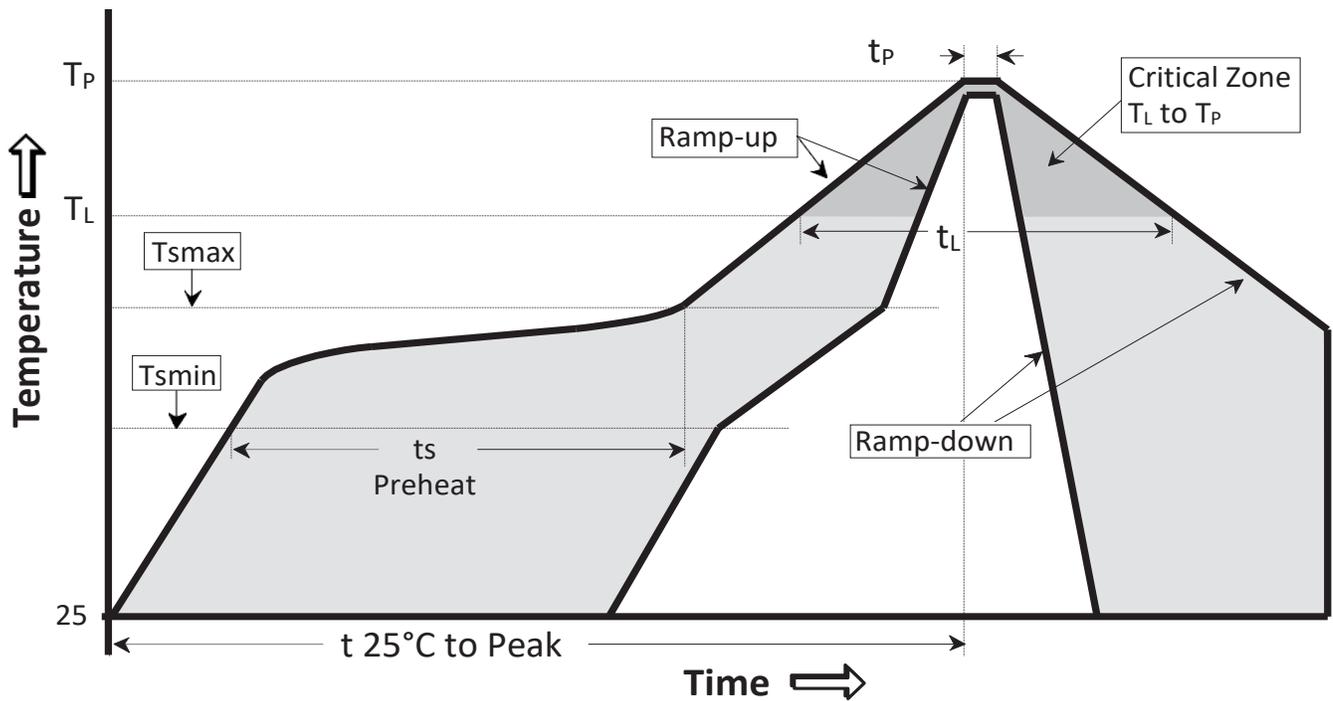
How to build a Part Number:

	Series	CTS	Parameter
	Package	3	3.2 x 1.5 mm SMD
		-	
	Frequency	32.768	KHz
		-	
Load Capacitance	Standard	12.5	12.5 pF
	Option	6	6 pF
		7	7 pF
		9	9 pF
		-	
	Frequency Tolerance	20	±20 PPM
		-	
	Temperature Range	See Notes	-40 to +85 ºC
Temperature Range (Extended)		X	-40 to +125 ºC
		-	
	Packaging	R	Tape and Reel

Part Number Example:
CTS3-32.768-9-20-R
CTS3- 3.2 x 1.5 mm SMD Crystal Unit
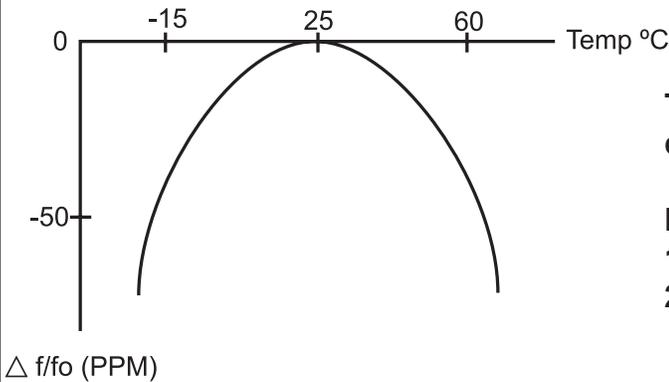**32.768 KHz Nominal Frequency**
9 pF Load Capacitance
20: ±20 PPM Frequency Tolerance
-40 to +85° C Temperature Range
R: Tape and Reel Packaging

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 ($\triangle$T) is (45-25) = +20 ° C
2- Change in frequency is (-0.034 x ($\triangle$° C)^2) =
  (-0.035 x (20)^2 = -13.6 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- Specification subject to change without notice.

Page:	4/4	Date:	Oct. 21, 2018	P/N:	CTS3 Series	