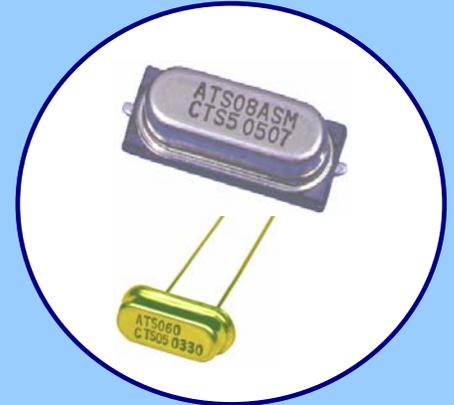


### FEATURES

- Standard HC-49/US [thru-hole] and HC-49/US-SM [surface mount] Packages
- Stable Frequency Over Temperature and Drive Level
- **Fundamental and 3<sup>rd</sup> Overtone Crystals**
- Frequency Range 3.2 – 64 MHz
- Frequency Tolerance,  $\pm 30$  ppm Standard
- Frequency Stability,  $\pm 50$  ppm Standard
- Operating Temperature,  $-20^{\circ}\text{C}$  to  $+70^{\circ}\text{C}$  Standard,  $-40^{\circ}\text{C}$  to  $+85^{\circ}\text{C}$  Available
- Tape & Reel Packaging Available
- **RoHS/Green Compliant [6/6]**

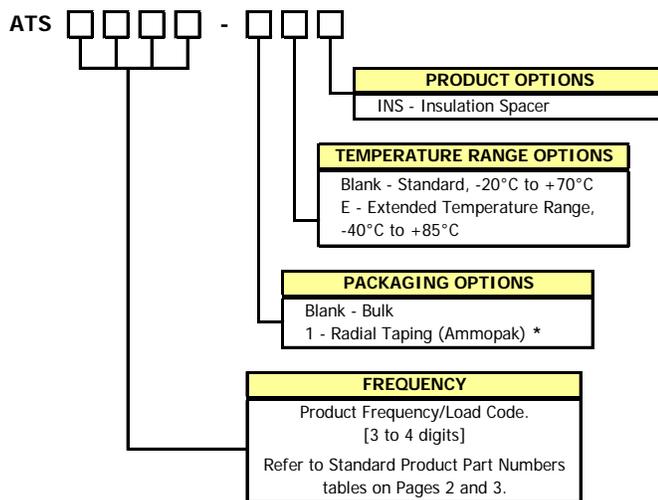


### APPLICATIONS

The ATS/ATS-SM crystal series offers excellent long-term stability and reliability in a proven resistance-weld metal package. The excellent shock performance makes it suitable for microprocessor, telecommunication, industrial, consumer electronics and networking applications.

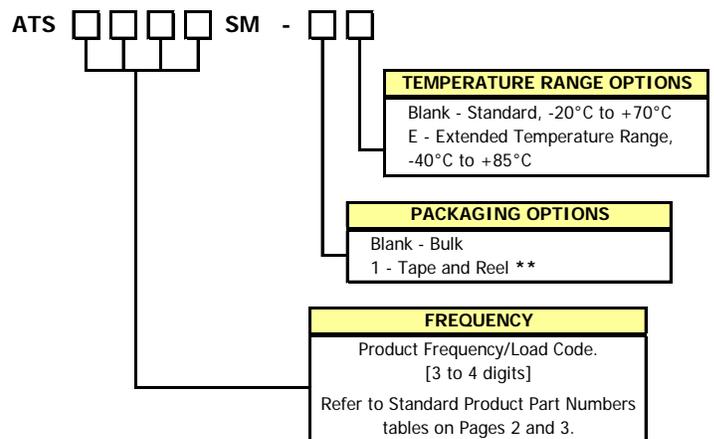
### ORDERING INFORMATION

#### ATS



\* Standard packaging is bulk in a bag.

#### ATS-SM



\*\* Standard packaging is tape and reel.  
CTS Distributors may use -T for tape and reel indicator.

### Non-Standard Ordering Options

- Contact your local CTS Representative or CTS Inside Sales Representative for assistance.

**ELECTRICAL CHARACTERISTICS**

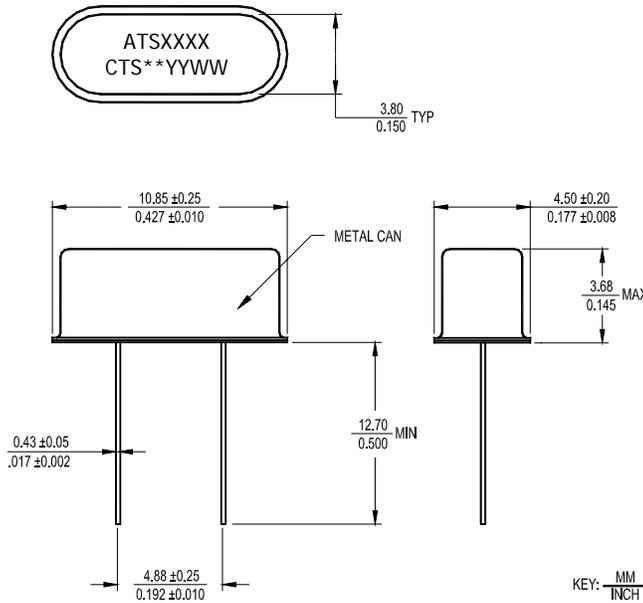
	PARAMETER	VALUE
<b>ELECTRICAL PARAMETERS</b>	Frequency Range	3.2 MHz to 64.0 MHz
	Operating Mode	Fundamental or 3rd Overtone
	Crystal Cut	AT-Cut
	Frequency Tolerance @ +25°C	± 30 ppm Standard *
	Frequency Stability Tolerance (Operating Temperature Range, Referenced to 25°C Reading)	± 50 ppm Standard *
	Operating Temperature Range	-20°C to +70°C * -40°C to +85°C Available, See Ordering Information
	Equivalent Series Resistance	See ESR Table
	Load Capacitance or Resonance Mode	See Standard Part Numbers tables *
	Shunt Capacitance (C <sub>0</sub> )	7.0 pF Maximum
	Drive Level	100 µW Typical, 1,000 µW Maximum
	Aging @ +25°C	±3 ppm/yr Typical, ±5 ppm/yr Maximum
	Insulation Resistance	500 Ohms @ DC 100V
	Storage Temperature Range	-40°C to +85°C
	Reflow Condition, per JEDEC J-STD-020	+260°C Maximum, 10 Seconds Maximum

\* Custom requirements may be available upon request.

**EQUIVALENT SERIES RESISTANCE TABLE**

FREQUENCY RANGE	OSCILLATION MODE	ESR MAXIMUM
3.20 MHz - < 4.00 MHz	Fundamental	150 Ohms
4.00 MHz - < 5.00 MHz	Fundamental	120 Ohms
5.00 MHz - < 8.00 MHz	Fundamental	80 Ohms
8.00 MHz - < 12.00 MHz	Fundamental	60 Ohms
12.00 MHz - < 20.00 MHz	Fundamental	40 Ohms
20.00 MHz - < 30.00 MHz	Fundamental	30 Ohms
27.00 MHz - 64.00 MHz	3rd Overtone	80 Ohms

**ATS PACKAGE DRAWING**



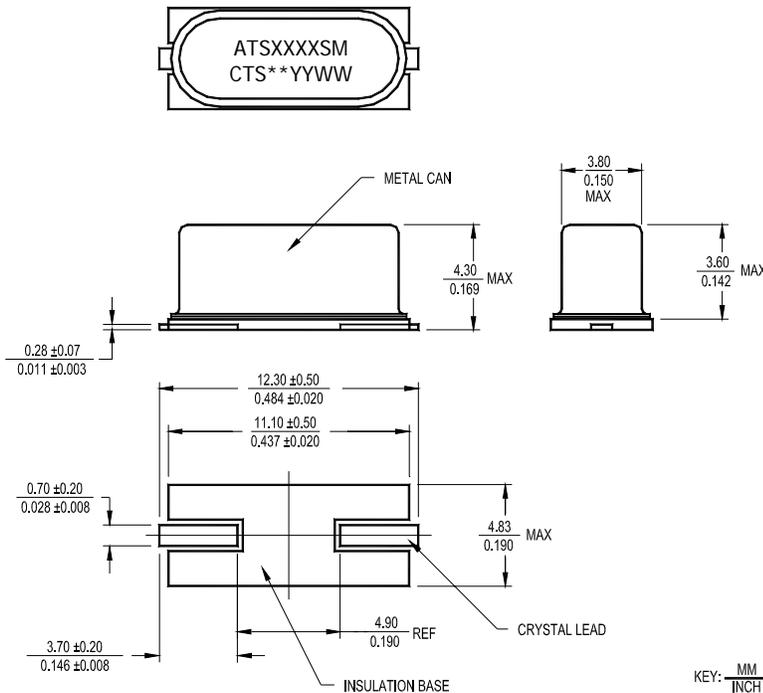
**MARKING INFORMATION**

- ATSXXXX - CTS Part Number.
  - The package code "1" is not required in the marking.
  - The -E is required in the marking for extended temperature range parts. [See Standard Product Part Numbers tables.]
- \*\* - Manufacturing Site Code.
- YYWW - Date Code, YY - year, WW - week.
- Complete CTS part number, frequency value and date code information must appear on bag and box labels.

**NOTES**

- Lead finish (e1), SnAgCu.
- MSL = 1.

**ATS-SM PACKAGE DRAWING**



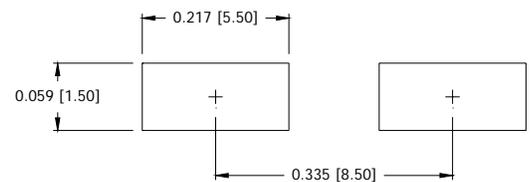
**MARKING INFORMATION**

- ATSXXXXSM - CTS Part Number.
  - The package code "1" is not required in the marking.
  - The -E is required in the marking for extended temperature range parts. [See Standard Product Part Numbers tables.]
- \*\* - Manufacturing Site Code.
- YYWW - Date Code, YY - year, WW - week.
- Complete CTS part number, frequency value and date code information must appear on bag and box labels.

**NOTES**

- Lead finish (e1), SnAgCu.
- MSL = 1.

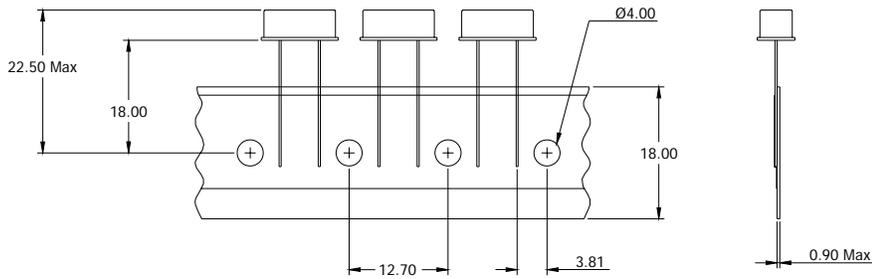
**SUGGESTED SOLDER PAD GEOMETRY**



**PACKAGING INFORMATION**

**ATS Radial Taping (Ammopak)**

DIMENSIONS IN MILLIMETERS



**ATS-SM Tape and Reel**

DIMENSIONS IN MILLIMETERS

