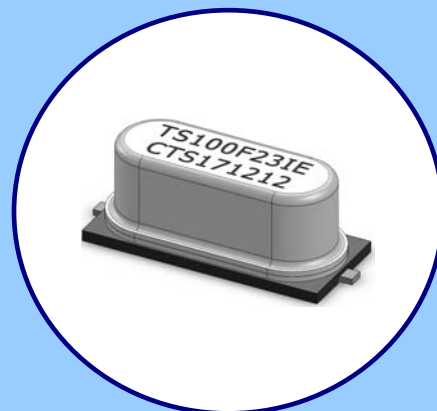




FEATURES

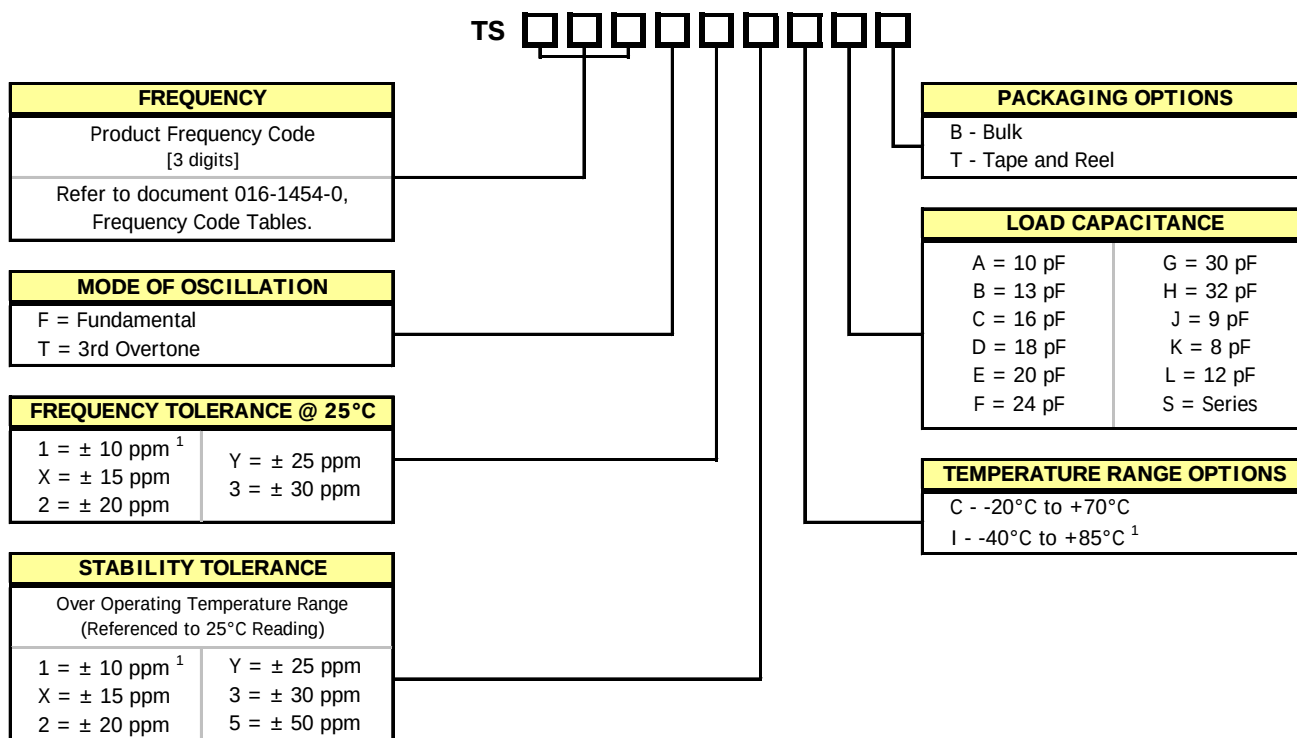
- **Standard HC-49/US-SM (surface mount) Package**
- **Fundamental and 3rd Overtone Crystals**
- Stable Frequency Over Temperature and Drive Level
- Frequency Range 3.2 – 64 MHz
- Frequency Tolerance, Options from ± 10 ppm to ± 30 ppm
- Frequency Stability, Options from ± 10 ppm to ± 50 ppm
- Operating Temperature, -20°C to $+70^{\circ}\text{C}$ & -40°C to $+85^{\circ}\text{C}$ Standard
- Tape & Reel Packaging Standard
- **RoHS/Green Compliant (6/6)**



APPLICATIONS

The ATSSMTS [Tight Stability] 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



1] Check factory availability for "11I" Tolerance/Stability/Temperature combination.

**Not all performance combinations and frequencies may be available.
Contact your local CTS Representative or CTS Inside Sales Representative for availability.**

ELECTRICAL CHARACTERISTICS

ELECTRICAL PARAMETERS	PARAMETER	VALUE
	Frequency Range	3.2 MHz to 64.0 MHz
	Operating Mode	Fundamental or 3rd Overtone
	Crystal Cut	AT-Cut
	Frequency Tolerance @ +25°C *	±10, ±15, ±20, ±25, ±30 ppm
	Frequency Stability Tolerance * (Over Operating Temperature Range, Referenced to +25°C Reading)	±10, ±15, ±20, ±25, ±30, ± 50 ppm
	Operating Temperature Range *	-20°C to +70°C and -40°C to +85°C
	Equivalent Series Resistance	See ESR Table
	Load Capacitance	See Ordering Information
	Shunt Capacitance (C ₀)	7.0 pF Maximum
	Drive Level	100 µW Typical, 1,000 µW Maximum
	Aging @ +25°C	±3 ppm/yr Typical, ±5 ppm/yr Maximum
	Storage Temperature Range	-40°C to +85°C

* See Ordering Information

EQUIVALENT SERIES RESISTANCE TABLE

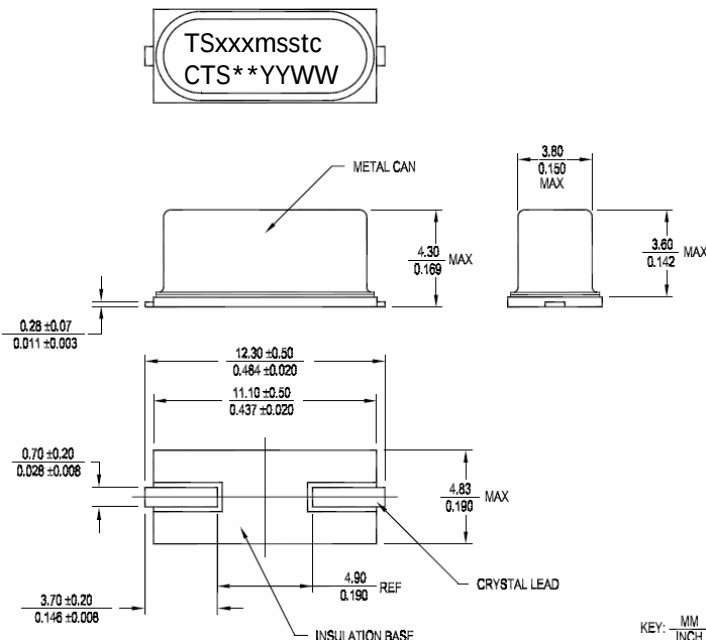
FREQUENCY RANGE	OSCILLATION MODE	ESR MAXIMUM
3.20 MHz - < 4.00 MHz	Fundamental	150 Ohms
4.00 MHz - < 5.00 MHz	Fundamental	120 Ohms
5.00 MHz - < 8.00 MHz	Fundamental	80 Ohms
8.00 MHz - < 12.00 MHz	Fundamental	60 Ohms
12.00 MHz - < 20.00 MHz	Fundamental	40 Ohms
20.00 MHz - < 30.00 MHz	Fundamental	30 Ohms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

SCHEMATIC



MECHANICAL SPECIFICATIONS

PACKAGE DRAWING



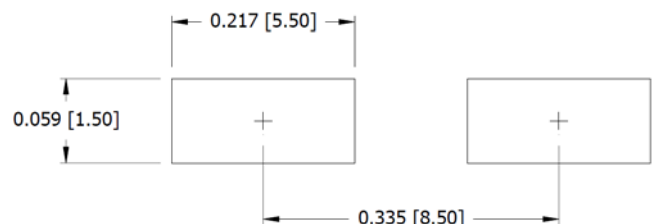
MARKING INFORMATION

- TSxxxxmsstc – Truncated CTS Part Number.
[Packaging code is not required in the marking.]
a) TS – ATSSMTS platform.
b) xxx – 3-digit Frequency Code. [Reference document 016-1454-01]
c) msstc – Tolerance, Stability, Temperature and Load Capacitance codes. Reference Ordering Information.
- ** - 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.
- Reflow conditions per JEDEC J-STD-020; 260°C maximum, 10 sec.
- MSL = 1.

SUGGESTED SOLDER PAD GEOMETRY



Key: Inch [mm]

PACKAGING INFORMATION

ATS-SM Tape and Reel [For Reference]

DIMENSIONS IN MILLIMETERS

