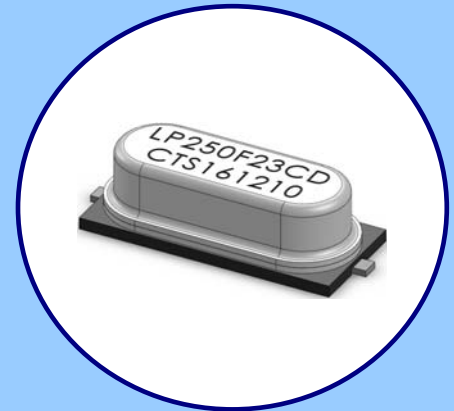




FEATURES

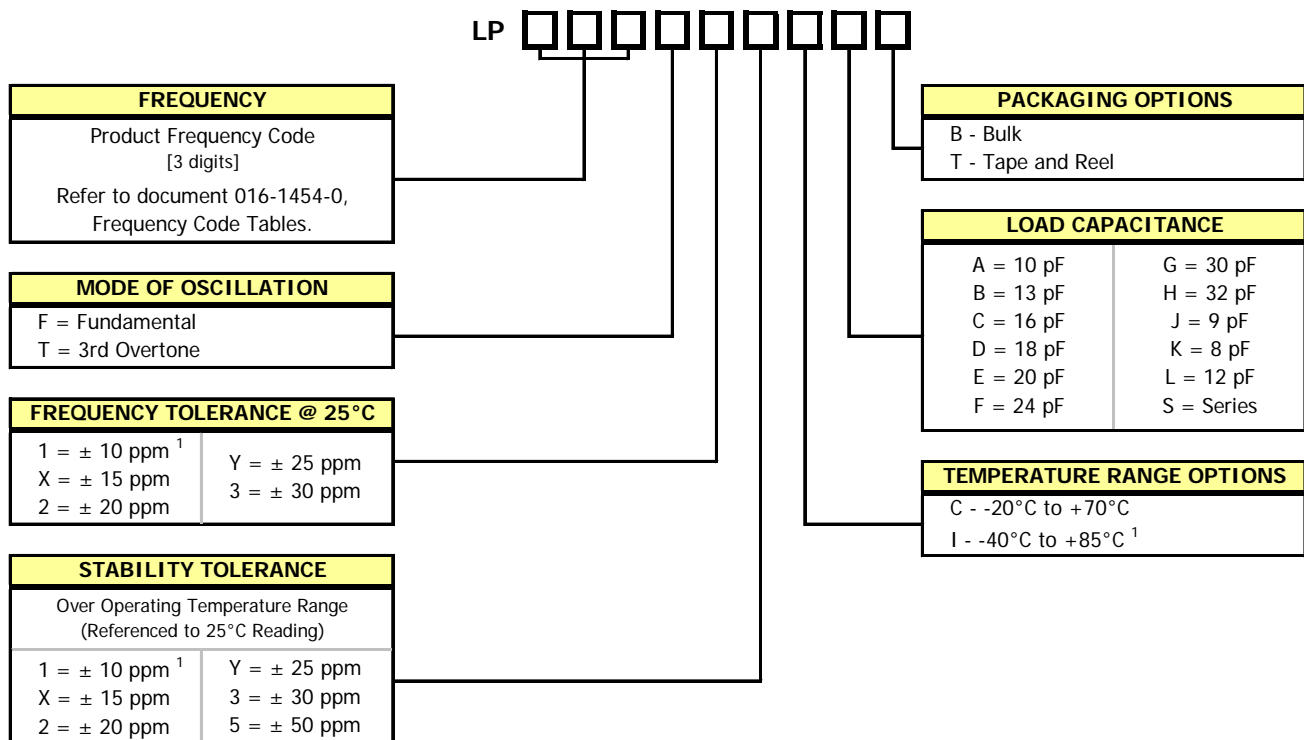
- **Low Profile Package Height, 3.2mm Maximum [HC-49/US-SM]**
- **Fundamental and 3rd Overtone Crystals**
- Stable Frequency Over Temperature and Drive Level
- Frequency Range 3.2 – 64 MHz
- Frequency Tolerance, Options from ± 10 ppm to ± 30 ppm
- Frequency Stability, Options from ± 10 ppm to ± 50 ppm
- 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 ATSSMLP [Low Profile] 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 "111" 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

| | PARAMETER | VALUE |
|------------------------------|--|--------------------------------------|
| ELECTRICAL PARAMETERS | 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

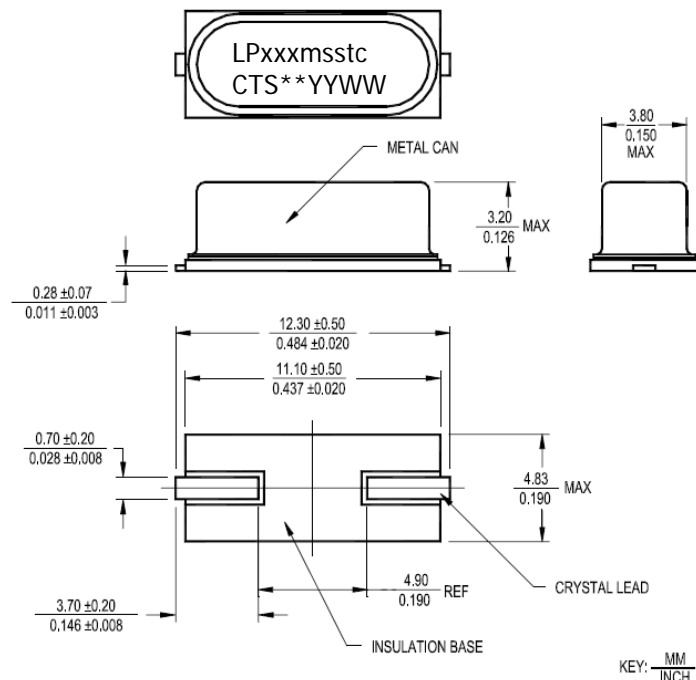
| FREQUENCY RANGE | OSCILLATION MODE | ESR MAXIMUM |
|-------------------------|------------------|-------------|
| 3.20 MHz - < 4.00 MHz | Fundamental | 150 Ohms |
| 4.00 MHz - < 5.00 MHz | Fundamental | 120 Ohms |
| 5.00 MHz - < 8.00 MHz | Fundamental | 80 Ohms |
| 8.00 MHz - < 12.00 MHz | Fundamental | 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



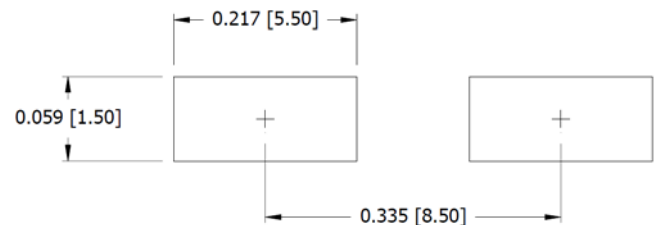
MARKING INFORMATION

- LPxxmsstc – Truncated CTS Part Number. [Packaging code is not required in the marking.]
 - LP – ATSSMLP platform.
 - xxx – 3-digit Frequency Code. [Reference document 016-1454-01]
 - m – Operating Mode; F = fundamental, T = 3rd Overtone.
 - sstc – 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

