

■ FEATURES:

- Surface Mount Ceramic base Weld Metal lid Package with 4 pads
- Stable frequency characteristics over temperature and drive level
- Packed in Embossed Carrier Tape & Reel for Automatic Handling (Standard 1,000 piece/reel compliant with EIA-481-2)

■ APPLICATIONS:

Surface mount 3.2 x 5.0mm x 1.0mm Max. crystal is ideal for application to high-density circuit boards with reliable precision & excellent shock performance in wireless telecommunications devices.

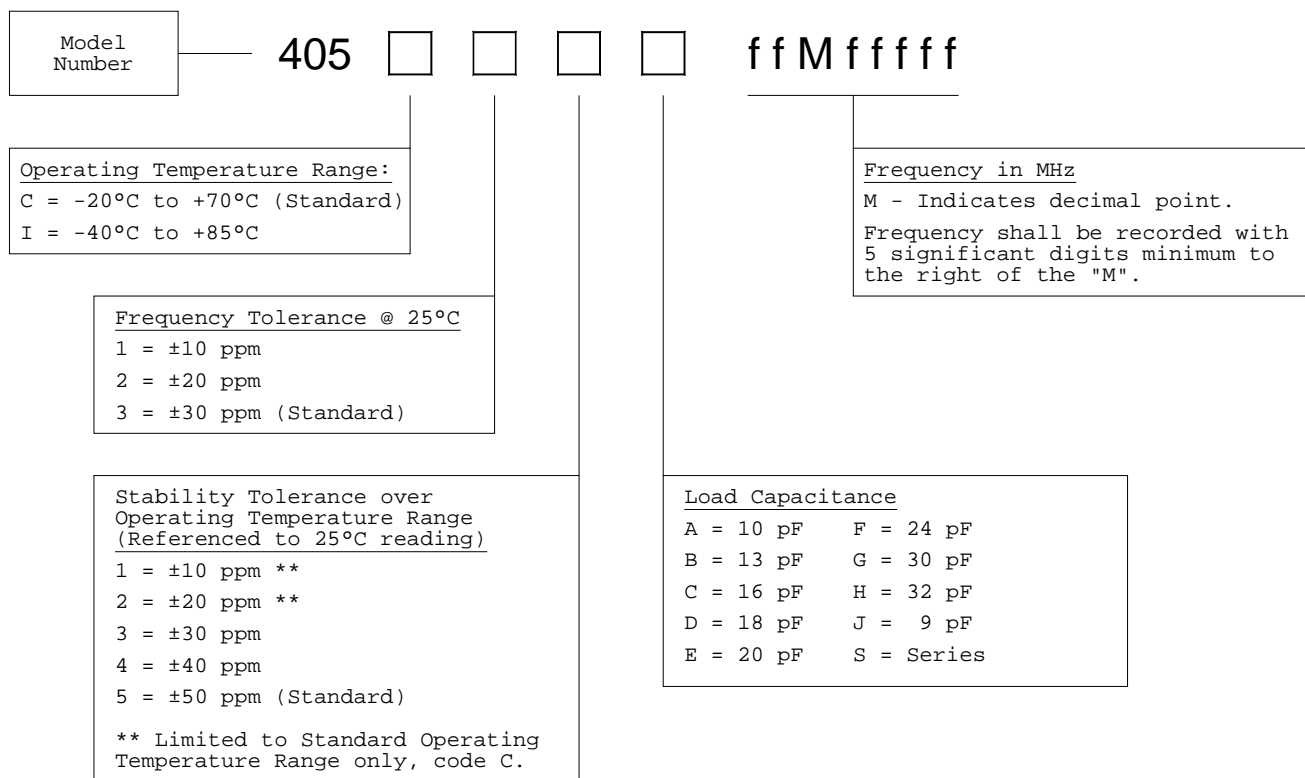
■ ELECTRICAL SPECIFICATIONS:

CTS Crystal Model Number	405
Operating Mode of Oscillation & Cut	Fundamental & AT-cut
Frequency Range	12.0 to 26.0 MHz
Frequency Calibration Tolerance @ 25°C	±30ppm Standard ( Other tighter tolerances are available; See P/N System ).
Frequency Stability Tolerance ( Ref. to 25°C readings over Operating Temperature Range )	±50ppm Standard. ( Other tighter tolerances are available; See P/N System ).
Operating Temperature Range	-20°C to +70 °C Standard. ( Extended -40°C to +85°C is available; See P/N System ).
Storage Temperature Range	-55°C to +125 °C in a non-operating condition
Drive Level	25 µw Typical & 100 µw Maximum
Equivalent Series Resistance Maximum (ESR Max.)	See ESR Table
Resonance Mode (To be specified by customer)	S for Series or Parallel with load capacitance 13Pf, 18Pf, 20Pf , Etc. ( See P/N System ).
Surface Mount Temperature Reflow Condition	255°C ±5°C & 10 Sec. Max.
Shunt Capacitance (C0)	7.0 pF Max. ( 3.0 pF Typ.)

■ ESR Table:

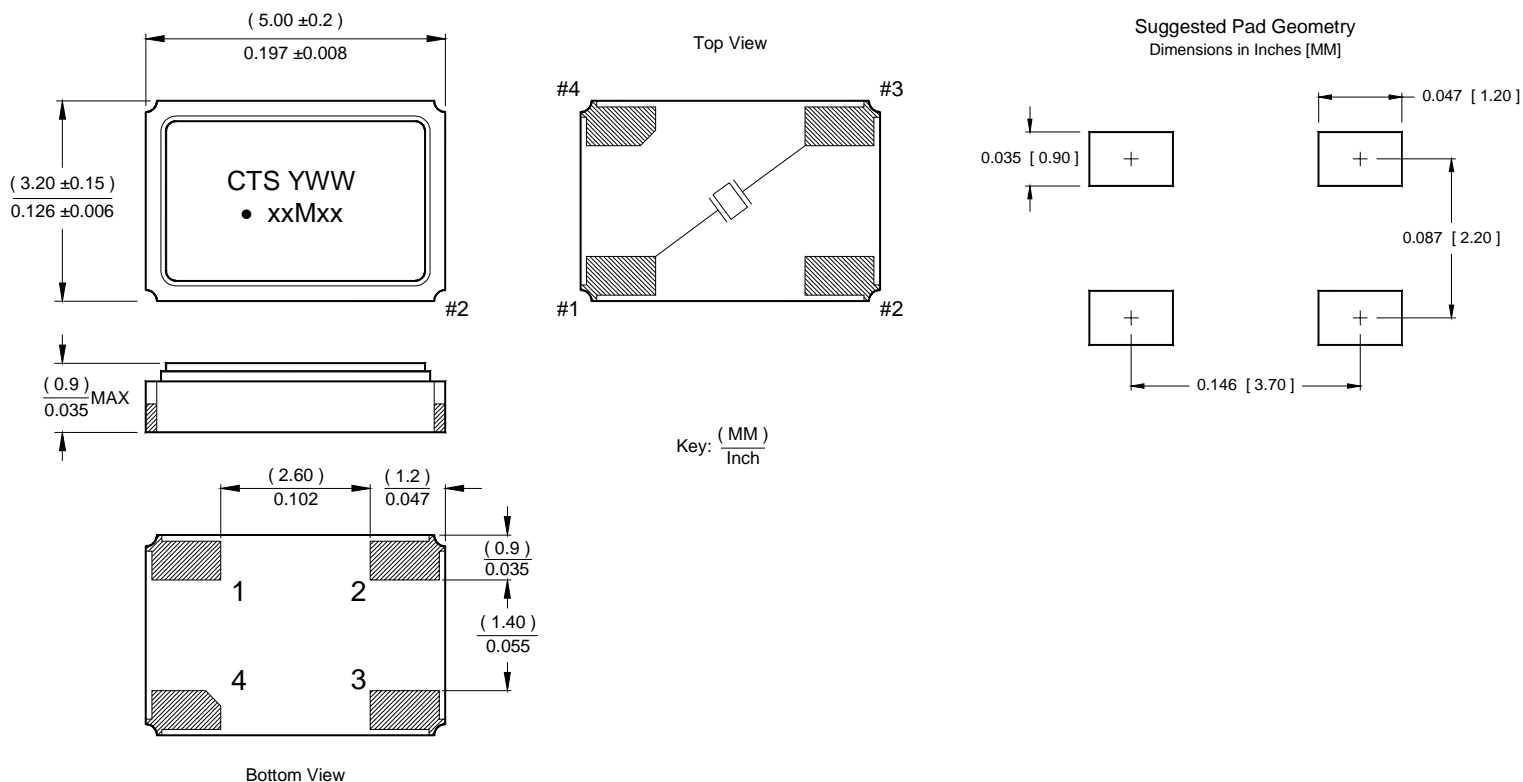
Frequency Range (MHz)	Mode of Oscillation	ESR Max. (Ohms)
12.0 MHz $\leq$ Freq. < 26.0 MHz	Fundamental	50

■ PART NUMBERING SYSTEM for Ordering Information:



Part Number Examples: 405C35A14M31818, 405I33H24M00000

▪ **MECHANICAL SPECIFICATIONS:** 4 Pad Terminations plated with 0.3 to 1.0 μm gold (Au).



▪ **PRODUCT MARKING:**

- YWW = Date Code (last digit of year & week number)
- xxMxx = Frequency shall be marked with 2 significant digits to the right of the "M".  
 (Customer specified codes maximum 6 characters can be marked instead of frequency)

■ **QUALITY AND RELIABILITY:**

- Quality Systems meet or exceed the requirements of ISO 9000: 2000 standards.
- Reliability Audits are performed on this or similar products with results available upon request.

■ **ENVIRONMENTAL SPECIFICATIONS:**

- Storage Temperature: -55°C to +125°C in a non-operating condition & no degradation of performance following such exposure
- Temperature Cycle: 400 cycles, -55°C to +125°C, 10 min dwell, 1 min transfer
- Mechanical Shock: 1,500g's, 0.5ms, ½ sine wave, 3 shocks each direction, in 3 planes
- Sinusoidal Vibration: 0.06" D.A., 10 to 55 Hz and 20g's, 55 to 2,000 Hz, 3 cycles per plane
- Gross Leak: No leak shall appear while immersed in an FC40 or equivalent liquid at 125°C for 20 seconds
- Fine Leak: Mass spectrometer leak rates less than  $2 \times 10^{-8}$  atm. cc/sec of Helium
- Resistance to Soldering Heat: Product must survive 3 reflows of 260°C peak, 10 seconds maximum
- High Temperature Operating Bias: 2,000 hours at 125°C, disregarding frequency shift
- Frequency Aging:  $\leq 5$  ppm shift in 1,000 hours at 85°C

■ **TAPE AND REEL PACKAGING INFORMATION:**

Standard packaging quantity shall be 1,000 pieces on a 180mm reel compliant with Standard EIA-481-2

