



**FEATURES**

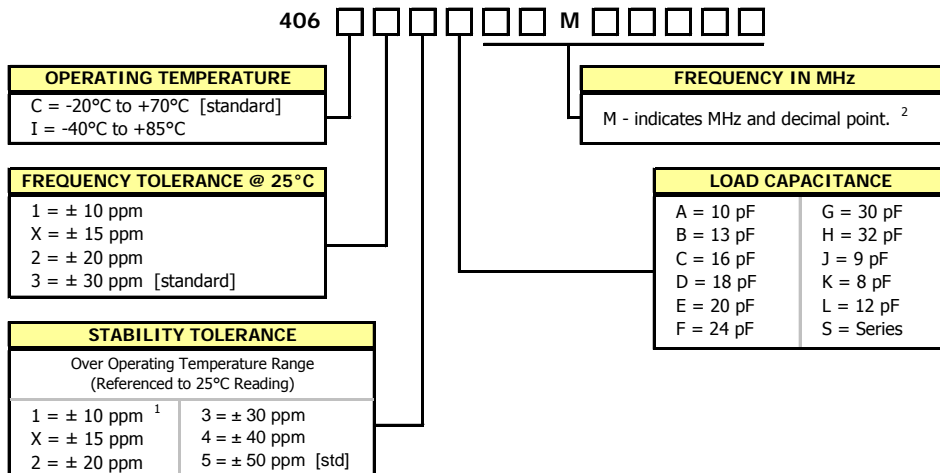
- Standard 6.0mm x 3.5mm Ceramic Surface Mount Package
- Fundamental Crystal Design
- Frequency Range 8 – 50 MHz
- Frequency Tolerance,  $\pm 30$  ppm Standard [other tolerances available]
- Frequency Stability,  $\pm 50$  ppm Standard [other stabilities available]
- Operating Temperature to  $-40^{\circ}\text{C}$  to  $+85^{\circ}\text{C}$
- Stable Frequency Over Temperature and Drive Level
- Tape & Reel Packaging Standard, EIA-481
- **RoHS/Green Compliant (6/6)**



**APPLICATIONS**

The Model 406 is a seam sealed ceramic packaged crystal offering reduced size, ideal for high-density circuit board applications. M406 offers reliable precision and excellent shock performance suitable for wireless communications, broadband access, WLAN/WiMax/WIFI, portable equipment, test and measurement, PCMCIA, computers and modems.

**ORDERING INFORMATION**



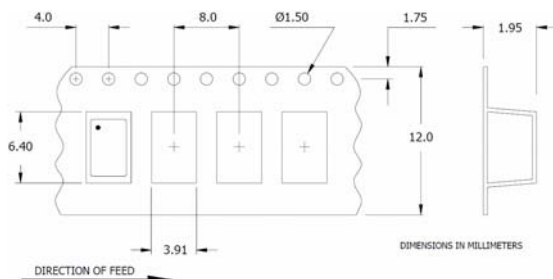
1] Only available with temperature range code "C".

2] Frequency is recorded with two leading digits before the 'M' and 5 significant digits after the 'M' (including zeros).  
[Ex. XXMXXXX (16M38400), XXMXXXX (14M31818)]

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

**PACKAGING INFORMATION [reference]**

Device quantity is 1k pcs. maximum per 180mm reel.



**ELECTRICAL CHARACTERISTICS**

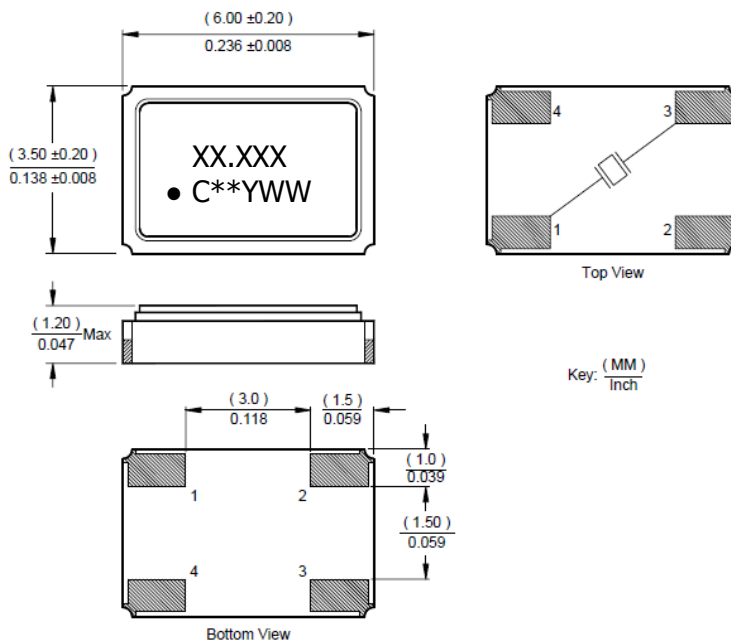
|                              | PARAMETER                                                                                  | VALUE                                                                                |
|------------------------------|--------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
| <b>ELECTRICAL PARAMETERS</b> | Frequency Range                                                                            | 8.0 MHz to 50.0 MHz                                                                  |
|                              | Operating Mode                                                                             | Fundamental                                                                          |
|                              | Crystal Cut                                                                                | AT-Cut                                                                               |
|                              | Frequency Tolerance @ 25°C                                                                 | ± 30 ppm standard<br>[± 10 ppm, ± 15 ppm and ± 20 ppm Available]                     |
|                              | Frequency Stability Tolerance<br>[Operating Temperature Range, Referenced to 25°C Reading] | ± 50 ppm standard<br>[± 10 ppm, ± 15 ppm, ± 20 ppm, ± 30 ppm and ± 40 ppm Available] |
|                              | Operating Temperature Range                                                                | -20°C to +70°C<br>-40°C to +85°C                                                     |
|                              | Equivalent Series Resistance                                                               | See ESR Table                                                                        |
|                              | Load Capacitance or Resonance Mode                                                         | See Ordering Information                                                             |
|                              | Shunt Capacitance (C <sub>0</sub> )                                                        | 4.0 pF typical<br>7.0 pF maximum                                                     |
|                              | Drive Level                                                                                | 10 µW typical<br>100 µW maximum                                                      |
|                              | Aging @ +25°C                                                                              | ±3 ppm/yr typical<br>±5 ppm/yr maximum                                               |
|                              | Insulation Resistance                                                                      | 500M Ohms @ 100V <sub>DC</sub> ±15V <sub>DC</sub>                                    |
|                              | Storage Temperature Range                                                                  | -55°C to +125°C                                                                      |
|                              | Reflow Condition, per JEDEC J-STD-020                                                      | +260°C maximum, 10 Seconds maximum                                                   |

**EQUIVALENT SERIES RESISTANCE TABLE**

| FREQUENCY RANGE         | MODE of OSCILLATION | ESR Maximum |
|-------------------------|---------------------|-------------|
| 8.00 MHz - 9.999 MHz    | Fundamental         | 80 Ohms     |
| 10.00 MHz - 15.999 MHz  | Fundamental         | 60 Ohms     |
| 16.000 MHz - 50.000 MHz | Fundamental         | 40 Ohms     |

**MECHANICAL SPECIFICATIONS**

**PACKAGE DRAWING**



**MARKING INFORMATION**

1. XX.XXX – Frequency marked with 3 significant digits after the decimal.
2. C – CTS identifier.
3. \*\* – Manufacturing Site code.
4. YWW – Date Code, Y – Last Digit of Year, WW – Week.

**NOTES**

1. Complete CTS part number, frequency value and date code information must appear on reel and carton labels.
2. Termination pads (e4); barrier plating is nickel (Ni) with gold (Au) flash plate.
3. Terminations #2, #4 and metal lid are connected internally and may be connected to ground for EMI suppression.
4. MSL = 1.

**SUGGESTED SOLDER PAD GEOMETRY**

