



FEATURES

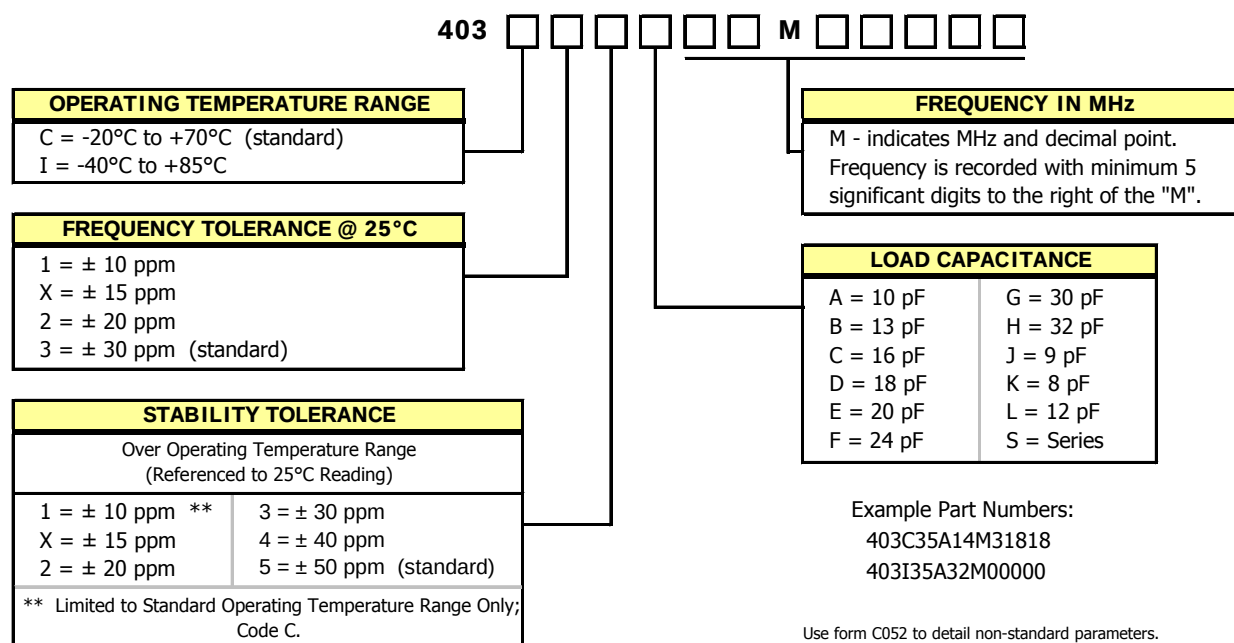
- Standard 3.2x2.5mm Surface Mount Footprint
- Stable Frequency Over Temperature and Drive Level
- Frequency Range 12 – 50 MHz
- Frequency Tolerance, ± 30 ppm Standard (± 10 ppm, ± 15 ppm and ± 20 ppm available)
- Frequency Stability, ± 50 ppm Standard ($\pm 10, \pm 15, \pm 20, \pm 30$ and ± 40 ppm available)
- Operating Temperature to -40°C to $+85^{\circ}\text{C}$
- Tape & Reel Packaging, EIA-481-2 Compliant
- **RoHS/Green Compliant (6/6)**

DESCRIPTION

The Model 403 is a ceramic packaged Crystal offering reduced size, ideal for high-density circuit board applications. The Model 403 offers reliable precision and excellent shock performance in wireless telecommunication devices.



ORDERING INFORMATION



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

ELECTRICAL CHARACTERISTICS

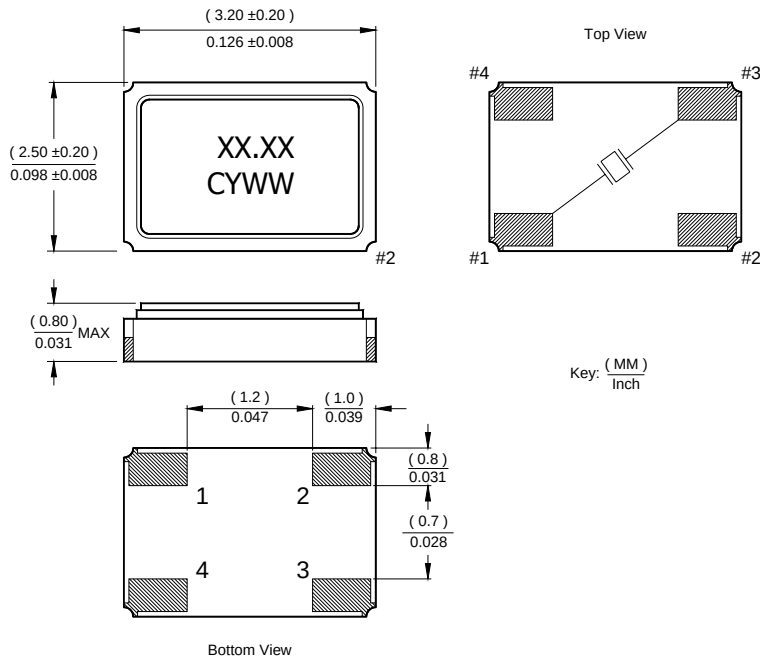
	PARAMETER	VALUE
Electrical Parameters	Operating Mode	Fundamental
	Crystal Cut	AT-Cut
	Frequency Range	12.0 MHz to 50.0 MHz
	Frequency Tolerance @ 25°C	± 30 ppm Standard (± 10 ppm, ± 15 ppm and ± 20 ppm Available)
	Frequency Stability Tolerance (Operating Temperature Range, Referenced to 25°C Reading)	± 50 ppm Standard (± 10 ppm, ± 15 ppm, ± 20 ppm, ± 30 ppm and ± 40 ppm Available)
	Operating Temperature Range	-20°C to +70°C Standard (-40°C to +85°C Available)
	Aging	± 3 ppm/year Maximum
	Storage Temperature Range	-55°C to +125°C
	Equivalent Series Resistance	See ESR Table
	Load Capacitance or Resonance Mode	See Ordering Information
	Shunt Capacitance (C_0)	5.0 pF Maximum (3.0 pF Typical)
	Drive Level	10 μ W Typical, 100 μ W Maximum
	Reflow Condition, per JEDEC J-STD-020	+255°C ± 5°C, 10 Seconds Maximum

EQUIVALENT SERIES RESISTANCE TABLE

FREQUENCY RANGE	MODE of OSCILLATION	ESR Maximum
12.00 MHz - 13.999 MHz	Fundamental	150 Ohms
14.00 MHz - 15.999 MHz	Fundamental	100 Ohms
16.00 MHz - 19.999 MHz	Fundamental	80 Ohms
20.00 MHz - 50.00 MHz	Fundamental	60 Ohms

MECHANICAL SPECIFICATIONS

PACKAGE DRAWING



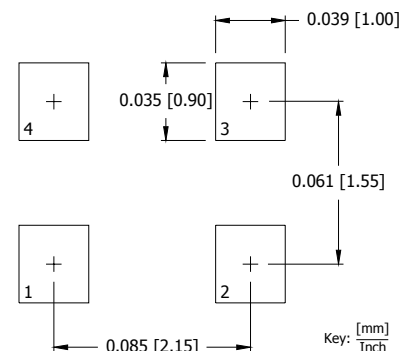
MARKING INFORMATION

1. XX.XX – Frequency marked with 2 significant digits after the decimal.
2. C – CTS and Pin 1 identifier.
3. YWW – Date Code, Y – Last Digit of Year, WW – Week.
4. Complete CTS part number, frequency value and date code information must appear on reel and box labels.

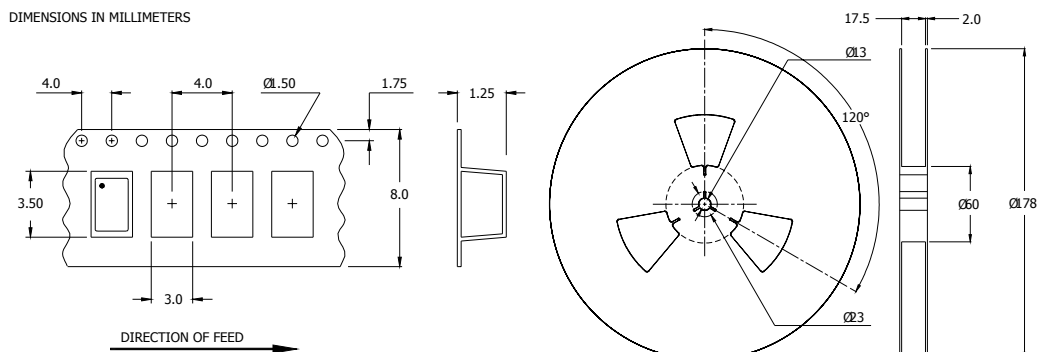
NOTES

1. Termination pads (e4), barrier-plating is nickel (Ni) with gold (Au) flash plate.
2. Terminations #2, #4 and the metal lid are connected internally. End user may connect these pins to circuit ground.

SUGGESTED SOLDER PAD GEOMETRY



TAPE AND REEL INFORMATION



Device quantity is 3,000 pieces minimum per 178mm reel.

ENVIRONMENTAL SPECIFICATIONS

Temperature Cycle:	400 cycles from -55°C to $+125^{\circ}\text{C}$, 10 minute dwell at each temperature, 1 minute transfer time between temperatures.
Mechanical Shock:	1,500g's, 0.5mS duration, $\frac{1}{2}$ sinewave, 3 shocks each direction along 3 mutually perpendicular planes (18 total shocks).
Sinusoidal Vibration:	0.06 inches double amplitude, 10 to 55 Hz and 20g's, 55 to 2,000 Hz, 3 cycles each in 3 mutually perpendicular planes (9 times total).
Gross Leak:	No leak shall appear while immersed in an FC40 or equivalent liquid at $+125^{\circ}\text{C}$ for 20 seconds.
Fine Leak:	Mass spectrometer leak rates less than 2×10^{-8} ATM cc/sec air equivalent.
Resistance to Solder Heat:	Product must survive 3 reflows of $+260^{\circ}\text{C}$ peak, 10 seconds maximum.
High Temperature Operating Bias:	2,000 hours at $+125^{\circ}\text{C}$, disregarding frequency shift.
Frequency Aging:	1,000 hours at $+85^{\circ}\text{C}$, maximum ± 5 ppm shift.
Insulation Resistance:	500M Ohms @ $100V_{\text{DC}} \pm 15V_{\text{DC}}$.
Moisture Sensitivity Level:	Level 1 per JEDEC J-STD-020.

QUALITY AND RELIABILITY

Quality systems meet or exceed the requirements of ISO 9000:2000 standards.

Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

CTS:

403C11E16M00000	403C11E32M00000	403C35E13M00000	403C35E26M00000	403C35E27M00000
403C35D25M00000	403C35E13M56000	403C35A16M00000	403I35A13M55375	403I35E25M00000
403C35A25M00000	403I35A30M00000	403C35D16M00000	403C35E28M63636	403C35E16M00000
403C35E24M00000	403C35E25M00000	403C35E18M43200	403C35E20M00000	403C35E44M00000
403C35E24M57600	403C35E48M00000	403C35E30M00000	403C35E22M11840	403C11A12M00000
403C11A13M00000	403C11A14M40000	403C11A14M74560	403C11A16M38400	403C11A16M80000
403C11A19M20000	403C11A19M68000	403C11A24M55350	403C11A24M57600	403C11A26M00000
403C11A27M00000	403C11A30M00000	403C11A36M00000	403C11B24M00000	403C11B26M00000
403C11B32M00000	403C11J12M00000	403C11J13M00000	403C11J14M40000	403C11J16M00000
403C11J19M68000	403C35D13M00000	403C35D14M31818	403C35D16M38400	403C35D19M66080
403C35D22M11840	403C35D24M57600	403C35D26M00000	403C35D28M37500	403C35D28M63636
403C35D29M49120	403C35D32M00000	403C35D33M00000	403C35D36M00000	403C35D44M00000
403C35E12M00000	403C35E14M31818	403C35E16M38400	403C35E19M66080	403C35E28M37500
403C35E29M49120	403C35E33M00000	403C35E36M00000	403C35E40M00000	403C35S30M00000
403C35S32M00000	403I35D12M00000	403I35D13M00000	403I35D14M31818	403I35D16M00000
403I35D16M38400	403I35D18M43200	403I35D19M66080	403I35D20M00000	403I35D22M11840
403I35D24M00000	403I35D24M57600	403I35D25M00000	403I35D26M00000	403I35D27M00000
403I35D28M37500	403I35D28M63636	403I35D29M49120	403I35D30M00000	403I35D32M00000
403I35D33M00000	403I35D36M00000	403I35D40M00000	403I35D44M00000	403I35D48M00000
403I35E12M00000	403I35E13M00000	403I35E14M31818	403I35E16M00000	403I35E16M38400