

# MODEL 402



# SURFACE MOUNT QUARTZ CRYSTAL

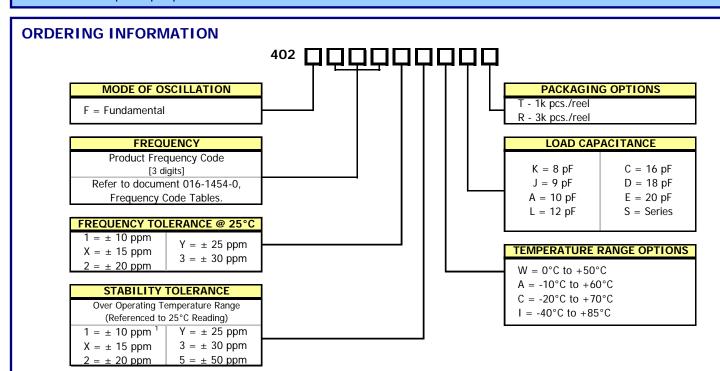
## **FEATURES**

- Standard 2.0mm x 1.6mm Seam Weld Package
- Fundamental Crystal Design
- Frequency Range 16 60 MHz
- Frequency Tolerance, ±20 ppm Standard [other tolerances available]
- Frequency Stability, ±30 ppm Standard [other stabilities available]
- Operating Temperature to -40°C to +85°C
- Tape & Reel Packaging Standard, EIA-481
- RoHS/Green Compliant [6/6]



## **APPLICATIONS**

Model 402 is a low cost device used in a wide range of commercial applications including notebooks, computer peripherals, audio visual, Bluetooth and USB interfaces, PDAs, and automotive electronics.

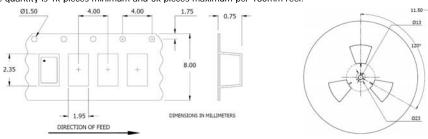


1] Only available with temperature range code "W, A & C".

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 pieces minimum and 3k pieces maximum per 180mm reel.



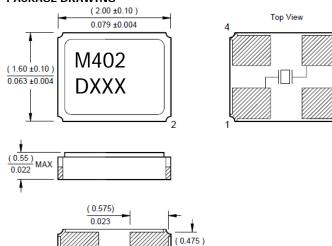


## **ELECTRICAL CHARACTERISTICS**

	PARAMETER	VALUE					
	Frequency Range	16 MHz to 60 MHz					
	Operating Mode	Fundamental					
S	Crystal Cut	AT-Cut					
2	Frequency Tolerance @ +25°C	±20 ppm, Standard					
/ETE	Frequency Stability Tolerance (Operating Temperature Range, Referenced to 25°C Reading)	±30 ppm, Standard					
PARAMETER	Operating Temperature Ranges	0°C to +50°C -20°C to +70°C	-10°C to +60°C -40°C to +85°C				
CAL PA		16 MHz - < 20 MHz	300 Ohms				
	Equivalent Series Resistance [Maximum]	20 MHz - < 30 MHz	200 Ohms				
	Equivalent series resistance [Maximum]	30 MHz - < 40 MHz	100 Ohms				
		40 MHz - 60 MHz	60 Ohms				
CTRI	Load Capacitance	See Ordering Information					
EC	Shunt Capacitance (C <sub>0</sub> )	3.0 pF Typical, 7.0 pF Maximum					
	Drive Level	10 μW Typ., 100 μW Max.					
ш.	Aging @ +25°C	±3 ppm/yr Typical					
	Insulation Resistance	500M Ohms @ DC 100V					
	Storage Temperature Range	-40°C to +85°C					

## MECHANICAL SPECIFICATIONS

#### PACKAGE DRAWING



0.019

View

0.70)

Key: (MM) Inch

#### MARKING INFORMATION

- 1. M402 CTS Model Series.
- 2. D Date code. See Table I for codes.
- 3. XXX Frequency code. Reference CTS document 016-1454-01.

#### NOTES

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- Complete CTS part number, frequency value, date code and manufacturing site code information must appear on reel and carton labels.
- 2. Terminations #2, #4 and the metal lid are connected internally. End user may connect these pins to circuit ground.
- Termination pads (e4); barrier plating is nickel [Ni] with gold [Au] flash plate.
- Reflow conditions per JEDEC J-STD-020; 260°C maximum, 10 seconds.
- 5. MSL = 1.

## SUGGESTED SOLDER PAD GEOMETRY

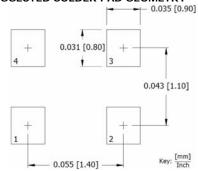


TABLE I - DATE CODE

(0.50)

0.020

			MONTH	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	ост	NOV	DEC	
	YEAR				JAN	FLB	WAK	AFK	IVIAT	JON	JUL	AUG	JLF	001	NOV	DEC
2001	2005	2009	2013	2017	Α	В	С	D	E	F	G	Н	J	K	L	М
2002	2006	2010	2014	2018	N	Р	Q	R	S	Т	U	V	W	Х	Υ	Z
2003	2007	2011	2015	2019	а	b	С	d	е	f	g	h	j	k	I	m
2004	2008	2012	2016	2020	n	р	q	r	S	t	u	V	w	х	у	Z