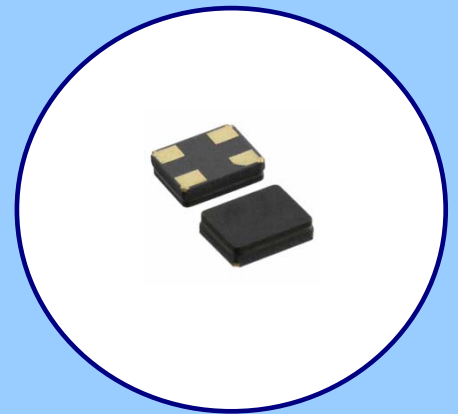


**FEATURES**

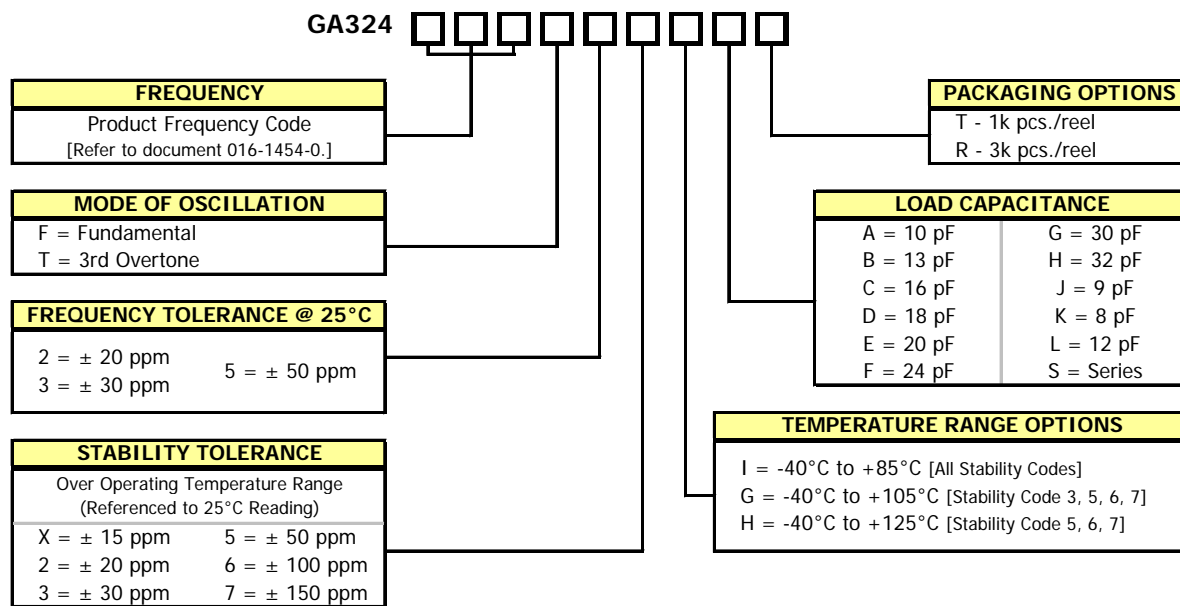
- **AEC-Q200 Compliant**
- **Standard 3.2mm x 2.5mm Glass Seal Package**
- **Fundamental Design**
- Frequency Range 12 – 40 MHz Fundamental, 36 – 120 MHz 3<sup>rd</sup> Overtone
- Frequency Tolerance;  $\pm 20$  ppm,  $\pm 30$  ppm and  $\pm 50$  ppm
- Frequency Stability, reference Ordering Information
- Operating Temperature, -40°C to +125°C standard
- Tape & Reel Packaging Standard, EIA-481
- **RoHS Compliant in Accordance with EU Directive 2011/65/EU**
  - Lead-Free Termination Finish
  - Exemption 7(c)-I, Electrical and electronic components containing lead [Pb] in glass



**APPLICATIONS**

Model GA324 is a low cost crystal specifically developed for use in automotive electronics.

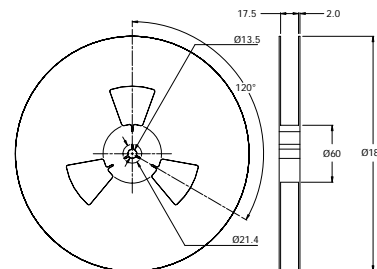
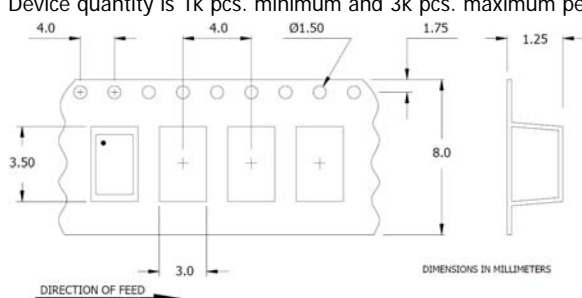
**ORDERING INFORMATION**



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



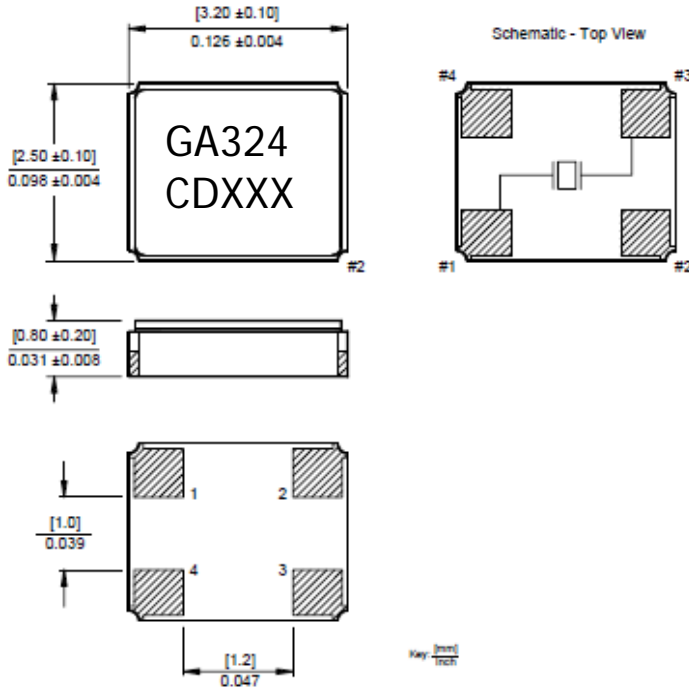
**ELECTRICAL CHARACTERISTICS**

PARAMETER	VALUE			
	Fundamental		3 <sup>rd</sup> Overtone	
Operating Mode	Fundamental		3 <sup>rd</sup> Overtone	
Frequency Range	12.0 MHz to 40.0 MHz		36.0 MHz to 120.0 MHz	
Crystal Cut	AT-Cut			
Frequency Tolerance @ 25°C	±20 ppm, ±30 ppm, ±50 ppm			
Frequency Stability Tolerance <sup>1</sup> [Operating Temperature Range, Referenced to 25°C Reading]	±15 ppm, ±20 ppm, ±30 ppm, ±50 ppm, ±100 ppm, ±150 ppm			
Operating Temperature Range <sup>1</sup>	-40°C to +85°C [All Stability Codes] -40°C to +105°C [Stability Code 3, 5, 6, 7] -40°C to +125°C [Stability Code 5, 6, 7]			
Equivalent Series Resistance	12.000 MHz - 13.999 MHz	150 Ohms maximum	36.000 MHz - 53.999 MHz	180 Ohms maximum
	14.000 MHz - 15.999 MHz	120 Ohms maximum	54.000 MHz - 120.000 MHz	120 Ohms maximum
	16.000 MHz - 18.999 MHz	100 Ohms maximum		
	19.000 MHz - 29.999 MHz	80 Ohms maximum		
	30.000 MHz - 40.000 MHz	60 Ohms maximum		
Load Capacitance or Resonance Mode [See Ordering Information for More Options]	8pF, 12pF standard			
Shunt Capacitance (C <sub>0</sub> )	3.0 pF typical, 5.0 pF maximum			
Drive Level	10 µW typical, 100 µW maximum			
Aging @ +25°C	±5 ppm/yr maximum			
Insulation Resistance [@ DC 100V]	500M Ohms minimum			
Storage Temperature Range	-40°C to +125°C			
Reflow Condition, per JEDEC J-STD-020	+260°C maximum, 10 Seconds maximum			

<sup>1</sup> See Ordering Information.

**MECHANICAL SPECIFICATIONS**

**PACKAGE DRAWING**



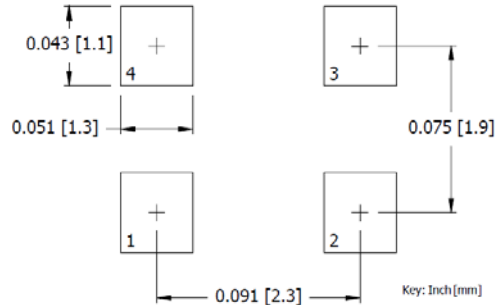
**MARKING INFORMATION**

- GA324 - CTS Model Series.
- C - CTS.
- D - Date code. See Table I for codes.
- XXX - Frequency code.  
[Reference CTS document 016-1450-0, Frequency Code Tables.]

**NOTES**

- Complete CTS part number, frequency value, date code and manufacturing site code information must appear on reel and carton labels.
- 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.

**SUGGESTED SOLDER PAD GEOMETRY**



**TABLE I - DATE CODE**

YEAR		MONTH				JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
2001	2005	2009	2013	2017	A	B	C	D	E	F	G	H	J	K	L	M	
2002	2006	2010	2014	2018	N	P	Q	R	S	T	U	V	W	X	Y	Z	
2003	2007	2011	2015	2019	a	b	c	d	e	f	g	h	j	k	l	m	
2004	2008	2012	2016	2020	n	p	q	r	s	t	u	v	w	x	y	z	