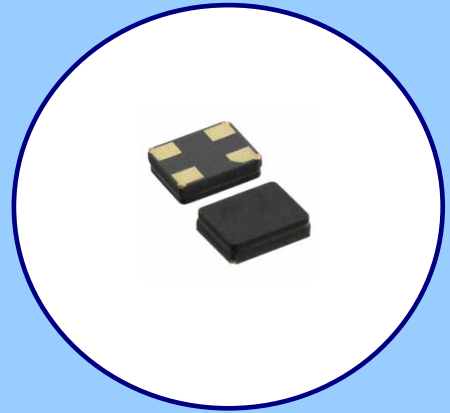


FEATURES

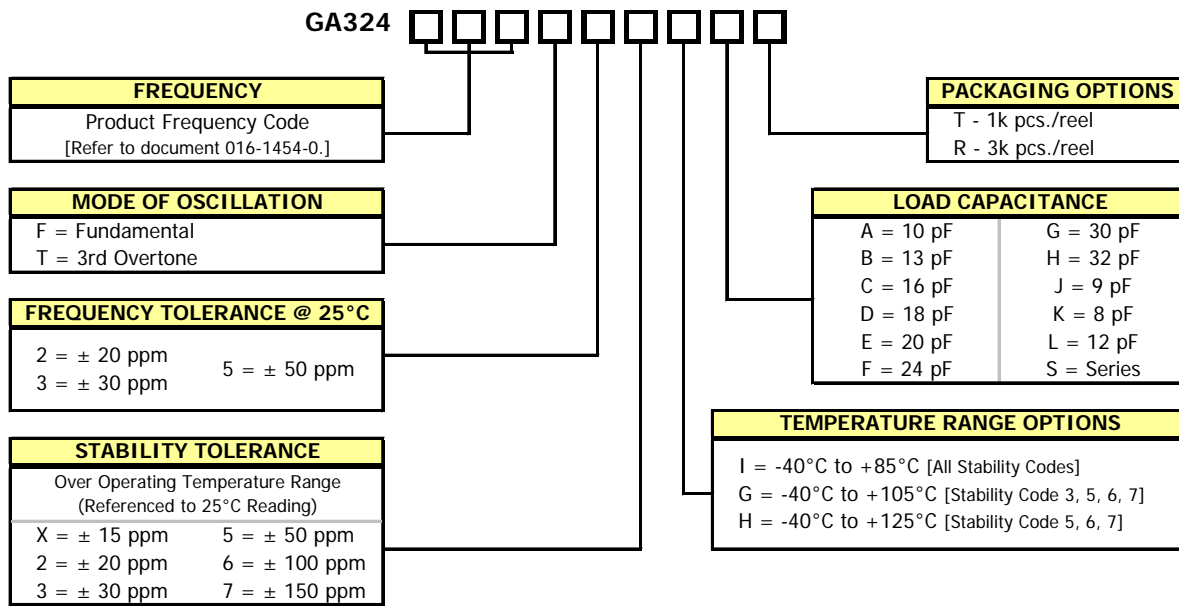
- **AEC-Q200 Compliant**
- **Standard 3.2mm x 2.5mm Glass Seal Package**
- **Fundamental Design**
- Frequency Range 12 – 40 MHz Fundamental, 36 – 120 MHz 3rd Overtone
- Frequency Tolerance; ± 20 ppm, ± 30 ppm and ± 50 ppm
- Frequency Stability, reference Ordering Information
- Operating Temperature, -40°C to $+125^{\circ}\text{C}$ 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.

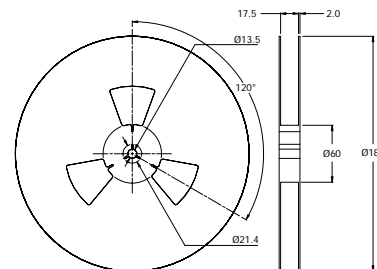
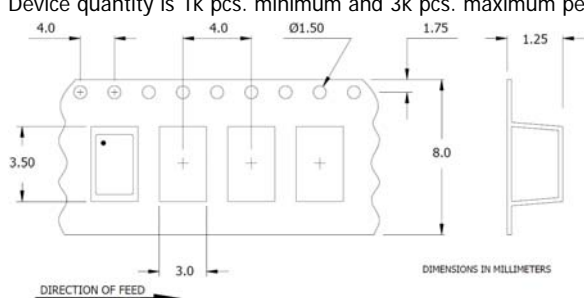
ORDERING INFORMATION



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.



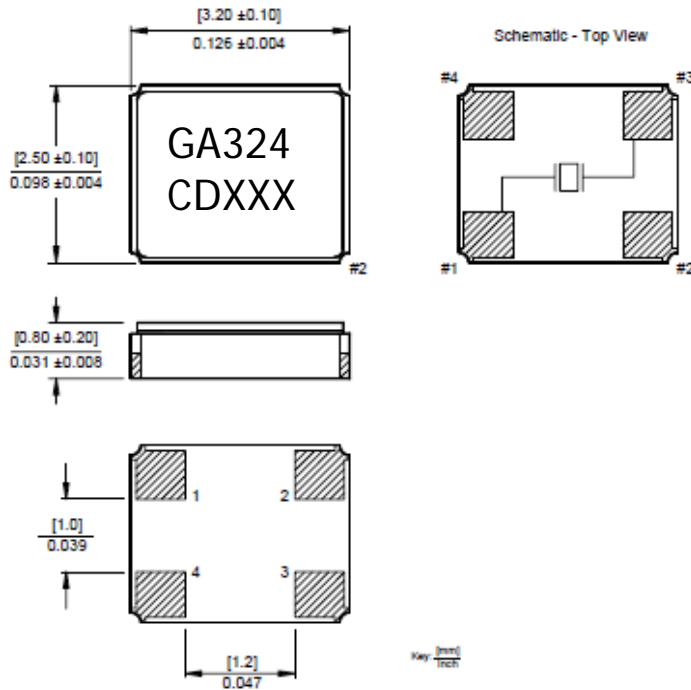
ELECTRICAL CHARACTERISTICS

PARAMETER	VALUE			
	Fundamental		3 rd Overtone	
Operating Mode	Fundamental		3 rd 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 ¹ [Operating Temperature Range, Referenced to 25°C Reading]	±15 ppm, ±20 ppm, ±30 ppm, ±50 ppm, ±100 ppm, ±150 ppm			
Operating Temperature Range ¹	-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 ₀)	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			

¹ 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

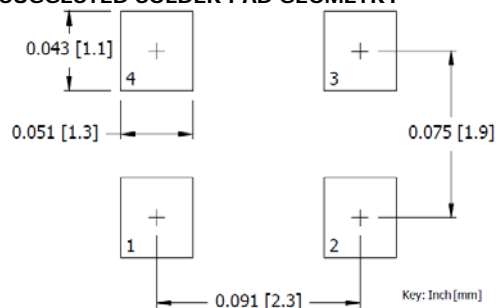


TABLE I - DATE CODE

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	