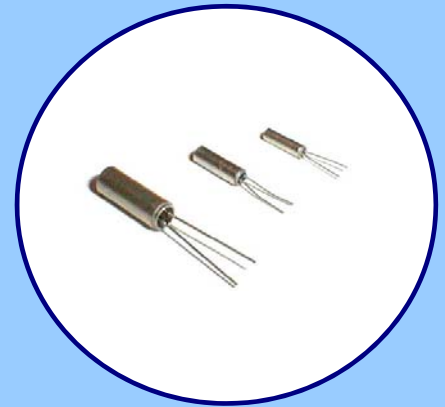




FEATURES

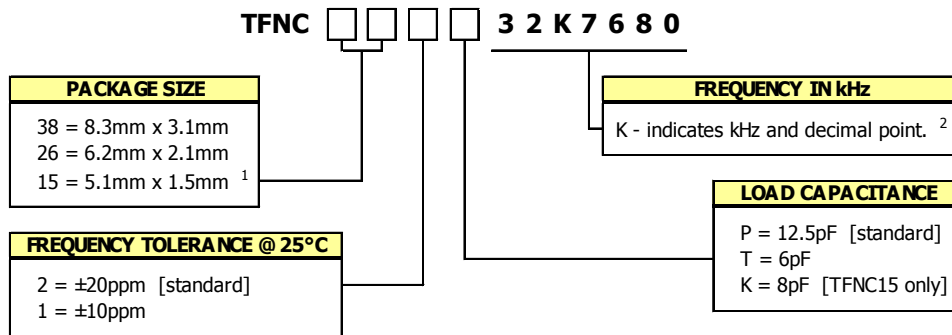
- **32.7680 kHz Frequency Reference**
- **Tuning Fork Crystal Design**
- **Package Sizes 8.3mmx3.1mm, 6.2mmx2.1mm, 5.1mmx1.5mm**
- **Cylindrical Package**
- Frequency Tolerance, ± 20 ppm Standard
- Frequency Temperature Coefficient, $-0.035\text{ppm}/^\circ\text{C}^2$
- Operating Temperature, -10°C to $+60^\circ\text{C}$ Standard
- Packaging, Bulk in Bag
- **RoHS Compliant in Accordance with EU Directive 2011/65/EU**



APPLICATIONS

The TFNC crystal series is ideal for use in a wide range of applications requiring a real-time frequency reference. Compatible to Citizen CFS Series and Epson C-Type.

ORDERING INFORMATION



¹ Contact factory for availability and MOQ requirements.
² Frequency is recorded with two leading digits before the 'K' and 4 significant digits after the 'K' (including zeros).

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

PACKAGING INFORMATION [reference]

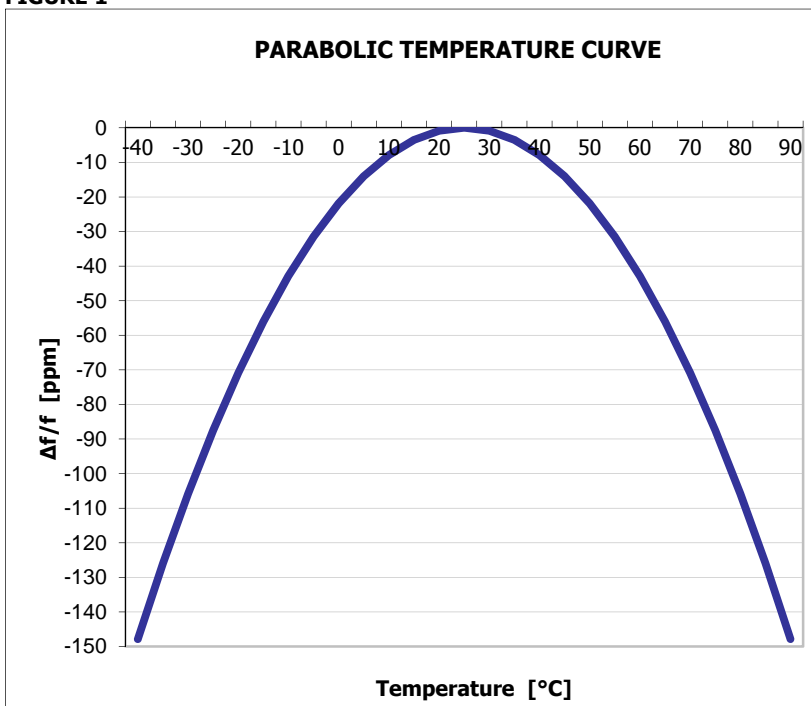
Packaging format is bulk in bag. Maximum 500pcs. per bag.

ELECTRICAL CHARACTERISTICS

	PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNIT
ELECTRICAL PARAMETERS	Frequency	f_0			32.7680		kHz
	Operating Mode	-		Flexural Mode [Tuning Fork]			-
	Frequency Tolerance *	$\Delta f/f_0$	@+25°C	-	10 or 20	-	± ppm
	Frequency Temperature Coefficient	$\Delta f/f_M$		-0.035 ± 0.006ppm/°C ²			-
	Frequency Stability			See Figure 1			
	Operating Temperature Range	T_A		-10	-	+60	°C
	Turnover Temperature	T_M	±5°C	-	+25	-	°C
	Load Capacitance *	C_L	TFNC38, TFNC26	-	12.5	-	pF
			TFNC15	-	8.0	-	
	Aging	$\Delta f/f_0$	@+25°C, 1st year	-	-	3.0	± ppm
	Drive Level	DL		-	-	1.0	µW
	Shunt Capacitance	C_0	TFNC38	-	1.6	-	pF
			TFNC26	-	1.35	-	
			TFNC15	-	1.0	-	
Motional Capacitance	C_1		-	3.0	-	fF	
Series Resistance	R_1		-	-	50	k Ohms	
Insulation Resistance	R_i	+100Vdc ±15Vdc	500	-	-	M Ohms	
Storage Temperature Range	T_{STR}		-40	-	+85	°C	

* See Ordering Information for available options.

FIGURE 1



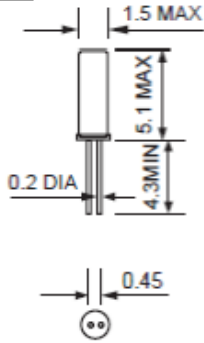
Frequency stability [ppm] is determined using parabolic curve, $\Delta f = \text{Temperature Coefficient}(T_A - T_M)^2$.

Ex. Find frequency stability at $T_A = 45^\circ\text{C}$
 $\Delta f = -0.035(45-25)^2$
 $\Delta f = -0.035(20)^2$
 $\Delta f = -14.0 \text{ ppm}$

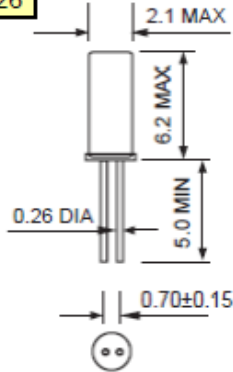
MECHANICAL SPECIFICATIONS

PACKAGE DRAWINGS

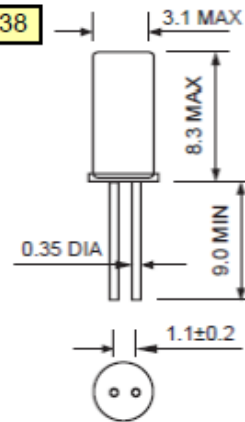
TFNC15



TFNC26



TFNC38



All dimensions are typical unless otherwise specified

Dimensions in Millimeters

MARKING INFORMATION

1. Product is not marked. See label on bag or carton.

NOTES

1. Complete CTS part number, frequency value, date code and manufacturing site code information must appear on bags and carton labels.
2. Termination pads (e2); barrier plating is nickel [Ni] with tin [Sn] copper [Cu] finish.
3. Soldering iron attach; 300°C maximum, 5 seconds.
4. MSL = 1.