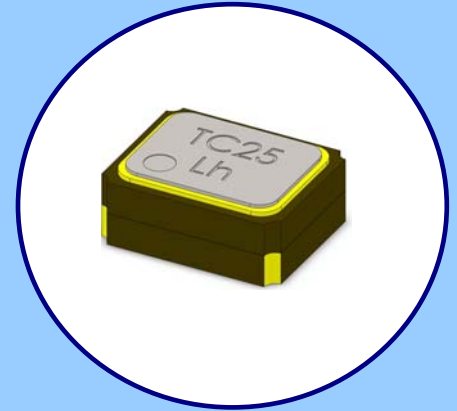




**FEATURES**

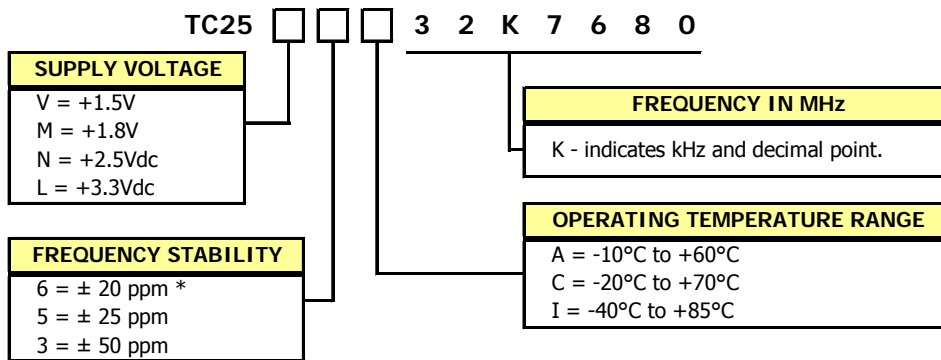
- 32.7680 kHz Frequency Reference
- Package Size 2.5mm x 2.0mm
- Fundamental Crystal Design
- Hermetic Ceramic Package
- Frequency Stability,  $\pm 50$  ppm Standard
- Operating Temperature,  $-40^{\circ}\text{C}$  to  $+85^{\circ}\text{C}$  Standard
- Tape & Reel Packaging, EIA-418
- **RoHS/Green Compliant [6/6]**



**APPLICATIONS**

Model TC25 is ideal for use in a wide range of communication equipment, Measurement equipment, industrial applications, automotive electronics, wireless communications, PDAs, mobile phones and notebooks.

**ORDERING INFORMATION**



\* Temperature codes A and C.

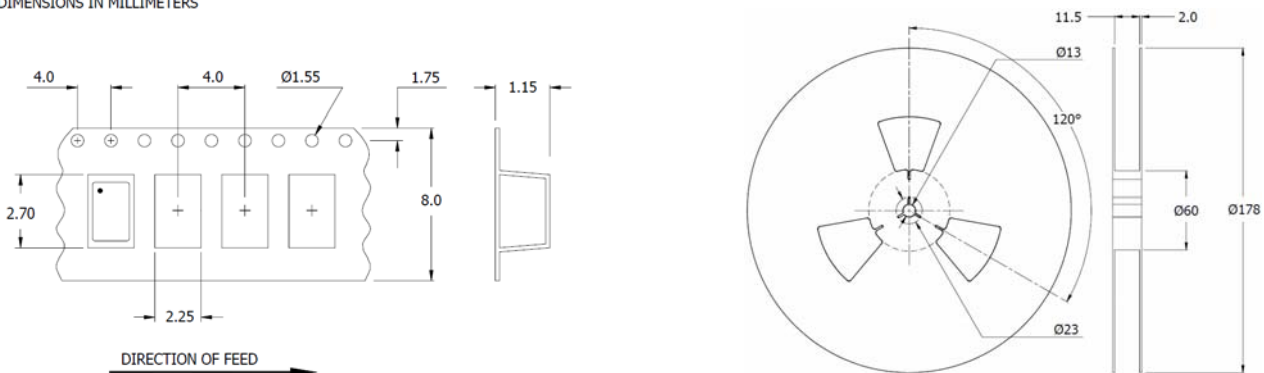
Example Part Numbers:

- TC25L3I32K7680
- TC25L5I32K7680

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

**PACKAGING INFORMATION [Reference Only]**

Device quantity is 1k pcs. minimum and 3k pcs. maximum per 180mm reel.  
DIMENSIONS IN MILLIMETERS

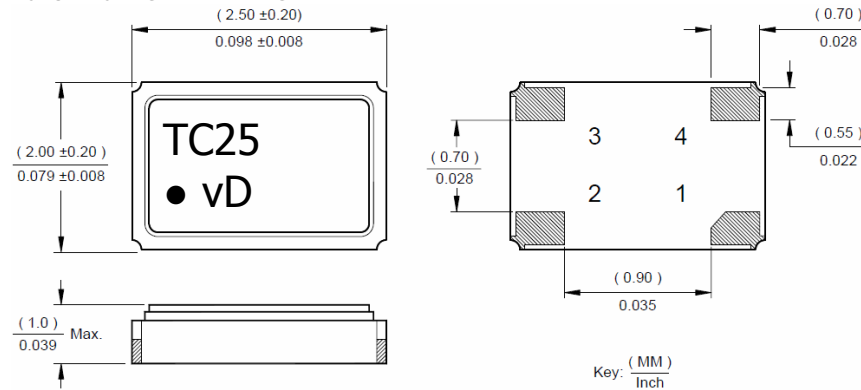


**ELECTRICAL CHARACTERISTICS**

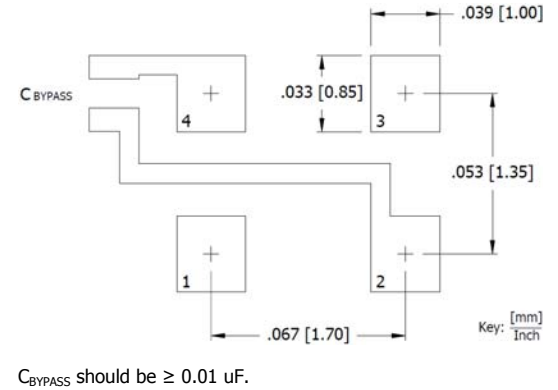
PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNIT
Frequency	$f_o$	-		32.7680		kHz
Operating Mode	-	-	AT Fundamental			-
Output Type	-	-	HCMOS			
Supply Voltage	$V_{CC}$	$\pm 10\%$	1.5, 1.8, 2.5, 3.3			V
Current	$I_{CC}$	15pF Load	-	-	3.0	mA
Frequency Stability	$\Delta f/f_o$	See Ordering Information	20, 25, 50			ppm
Operating Temperature Range	$T_A$	-	-10	-	+60	°C
			-20	-	+70	
			-40	-	+85	
Load Capacitance	$C_L$	CMOS	-	15	-	pF
Output Voltage Levels						
Logic '1' Level	$V_{OH}$	CMOS Load	0.9 $V_{CC}$	-	-	V
Logic '0' Level	$V_{OL}$	CMOS Load	-	-	0.1 $V_{CC}$	
Rise and Fall Time	$T_{r}, T_f$	-	-	-	50	ns
Output Duty Cycle	SYM	@ 50% Level	45	-	55	%
Start-up Time	$T_S$	Application of $V_{CC}$	-	5.0	10	ms
Enable Function						
Enable Input Voltage	$V_{IH}$	Pin 1 Logic '1', Output Enabled	0.7 $V_{CC}$	-	-	V
Disable Input Voltage	$V_{IL}$	Pin 1 Logic '0', Output Disabled	-	-	0.3 $V_{CC}$	
Aging	$\Delta f/f_o$	@ +25°C, 1st year	-	3.0	5.0	$\pm$ ppm
Storage Temperature Range	$T_{STR}$	-	-55	-	+125	°C

**MECHANICAL SPECIFICATIONS**

**TC25 PACKAGE DRAWING**



**SUGGESTED SOLDER PAD GEOMETRY**



**MARKING INFORMATION**

- TC25 – CTS Model Series.
- – Pin 1 identifier.
- v – Voltage code.  
[L=3.3V, N=2.5V, M=1.8V, V=1.5V]
- D – Date code. See Table I for codes.

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

**NOTES**

- Termination pads (e4); barrier plating is nickel [Ni] with gold [Au] flash plate.
- Reflow conditions per JEDEC J-STD-020; 260°C maximum, 20 seconds.
- MSL = 1.

**PIN ASSIGNMENTS**

PIN	SYMBOL	DESCRIPTION
1	EOH	Enable Input
2	GND	Circuit & Package Ground
3	Output	RF Output
4	$V_{CC}$	Supply Voltage

**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		