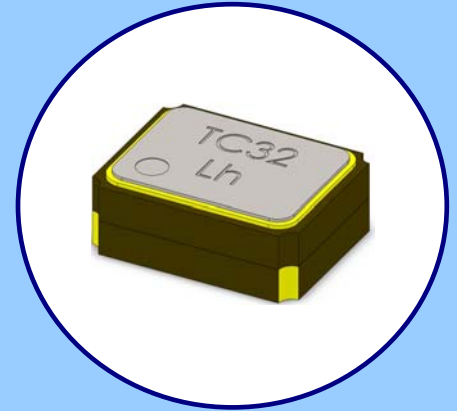




### FEATURES

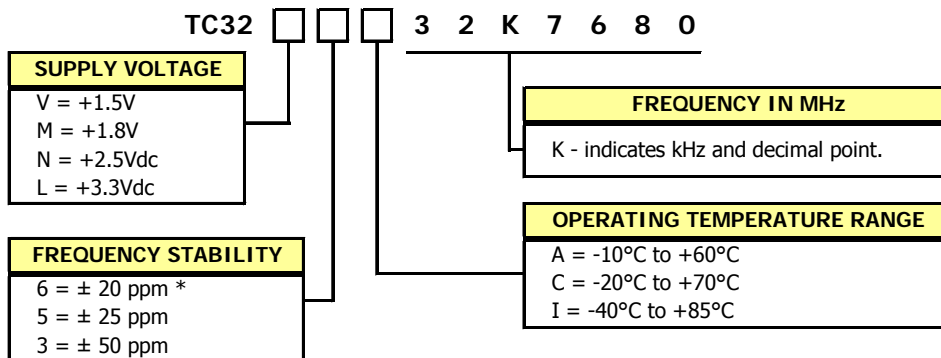
- 32.7680 kHz Frequency Reference
- Package Size 3.2mm x 2.5mm
- Fundamental Crystal Design
- Hermetic Ceramic Package
- Frequency Stability,  $\pm 50$  ppm Standard
- Operating Temperature,  $-40^{\circ}\text{C}$  to  $+85^{\circ}\text{C}$  Standard
- Tape & Reel Packaging, EAI-418
- **RoHS/Green Compliant [6/6]**



### APPLICATIONS

Model TC32 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:

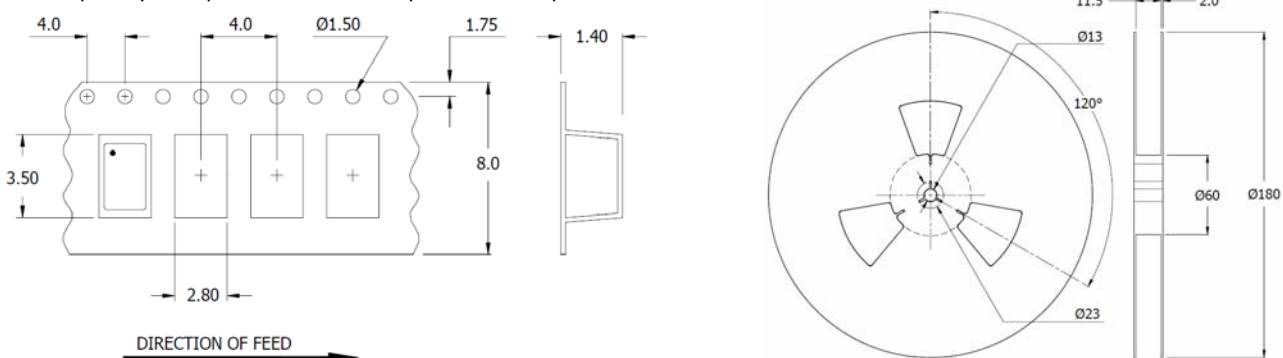
TC32L3I32K7680

TC32L5I32K7680

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.

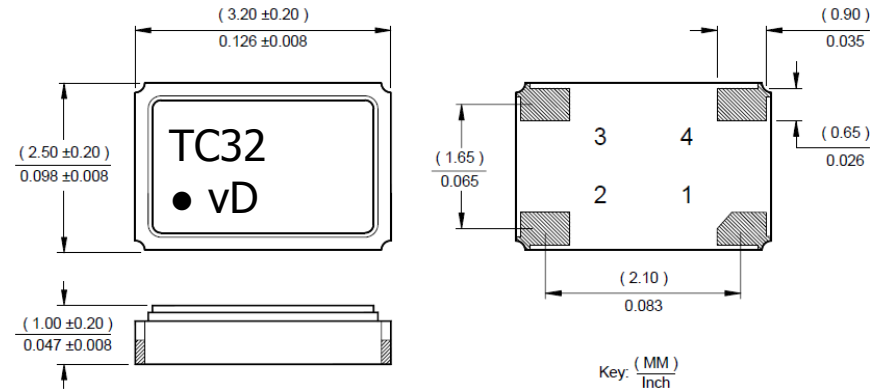


**ELECTRICAL CHARACTERISTICS**

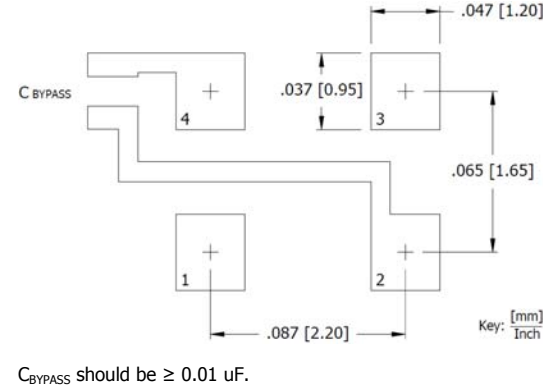
ELECTRICAL PARAMETERS	PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNIT
	Frequency	$f_o$	-	-	32.7680	-	kHz
	Operating Mode	-	-	AT Fundamental			-
	Output Type	-	-	HCMOS			-
	Supply Voltage	$V_{CC}$	±10%	1.5, 1.8, 2.5, 3.3			V
	Current	$I_{CC}$	15pF Load	-	-	3.0	mA
	Frequency Stability	$\Delta f/f_o$	See Ordering 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 $V_{CC}$	V	
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 $V_{CC}$	V	
Aging	$\Delta f/f_o$	@ +25°C, 1st year	-	3.0	5.0	± ppm	
Storage Temperature Range	$T_{STR}$	-	-55	-	+125	°C	

**MECHANICAL SPECIFICATIONS**

**TC32 PACKAGE DRAWING**



**SUGGESTED SOLDER PAD GEOMETRY**



**MARKING INFORMATION**

- TC32 – 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
					A	B	C	D	E	F	G	H	J	K	L	M
2001	2005	2009	2013	2017	N	P	Q	R	S	T	U	V	W	X	Y	Z
2002	2006	2010	2014	2018	a	b	c	d	e	f	g	h	j	k	l	m
2003	2007	2011	2015	2019	n	p	q	r	s	t	u	v	w	x	y	z
2004	2008	2012	2016	2020												