



Chipsmall Limited consists of a professional team with an average of over 10 year of expertise in the distribution of electronic components. Based in Hongkong, we have already established firm and mutual-benefit business relationships with customers from,Europe,America and south Asia,supplying obsolete and hard-to-find components to meet their specific needs.

With the principle of “Quality Parts,Customers Priority,Honest Operation,and Considerate Service”,our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip,ALPS,ROHM,Xilinx,Pulse,ON,Everlight and Freescale. Main products comprise IC,Modules,Potentiometer,IC Socket,Relay,Connector.Our parts cover such applications as commercial,industrial, and automotives areas.

We are looking forward to setting up business relationship with you and hope to provide you with the best service and solution. Let us make a better world for our industry!



## Contact us

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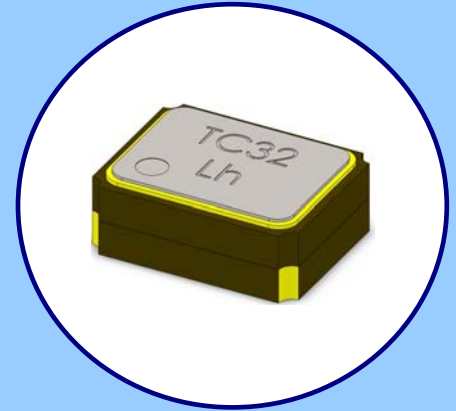
Address: A1208, Overseas Decoration Building, #122 Zhenhua RD., Futian, Shenzhen, China





**FEATURES**

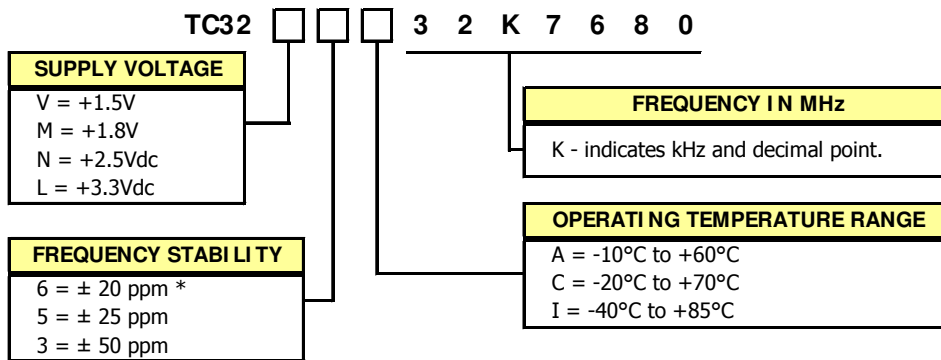
- 32.7680 kHz Frequency Reference
- Package Size 3.2mm x 2.5mm
- Fundamental Crystal Design
- Hermetic Ceramic Package
- Frequency Stability,  $\pm 50$  ppm Standard
- Operating Temperature,  $-40^{\circ}\text{C}$  to  $+85^{\circ}\text{C}$  Standard
- Tape & Reel Packaging, EAI-418
- **RoHS/ Green Compliant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

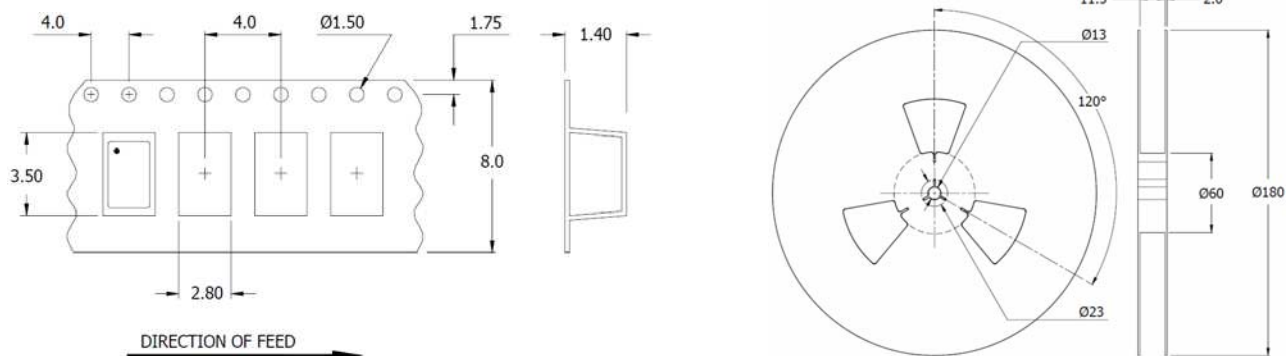
Example Part Numbers:

- 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.

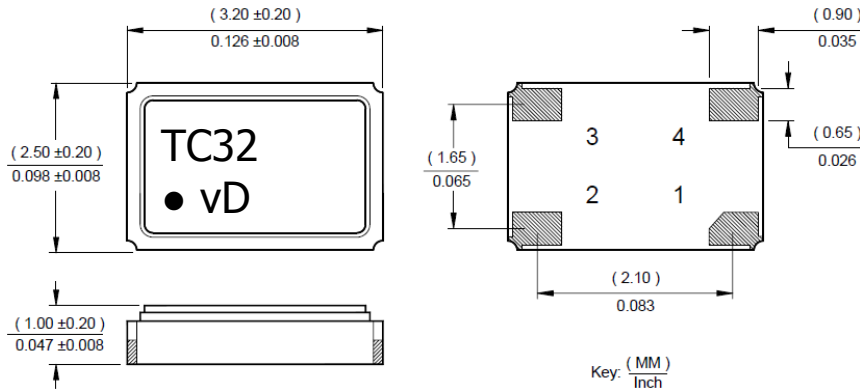


**ELECTRICAL CHARACTERISTICS**

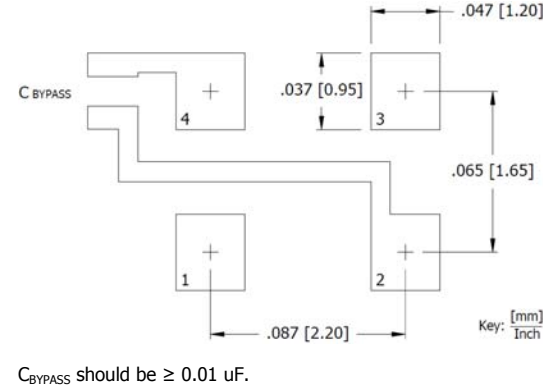
PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNIT
Frequency	$f_o$	-	-	32.7680	-	kHz
Operating Mode	-	-	AT Fundamental			-
Output Type	-	-	HCMOS			-
Supply Voltage	$V_{CC}$	$\pm 10\%$	1.5, 1.8, 2.5, 3.3			V
Current	$I_{CC}$	15pF Load	-	-	3.0	mA
Frequency Stability	$\Delta f/f_o$	See Ordering Information	20, 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 $V_{CC}$	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	$\pm$ 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
		2001	2005	2009	2013	2017												
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		