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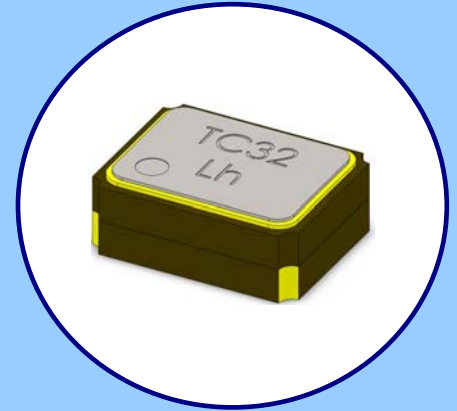
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FEATURES

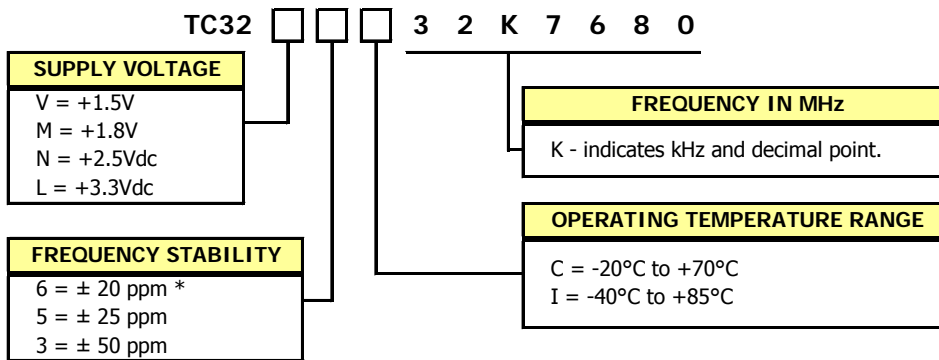
- 32.7680 kHz Frequency Reference
- Package Size 3.2mm x 2.5mm
- Fundamental Crystal Design
- Hermetic Ceramic Package
- Frequency Stability, ± 50 ppm Standard
- Operating Temperature, -40°C to $+85^{\circ}\text{C}$ Standard
- Tape & Reel Packaging, EAI-418
- **RoHS/Green Compliant (6/6)**



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:

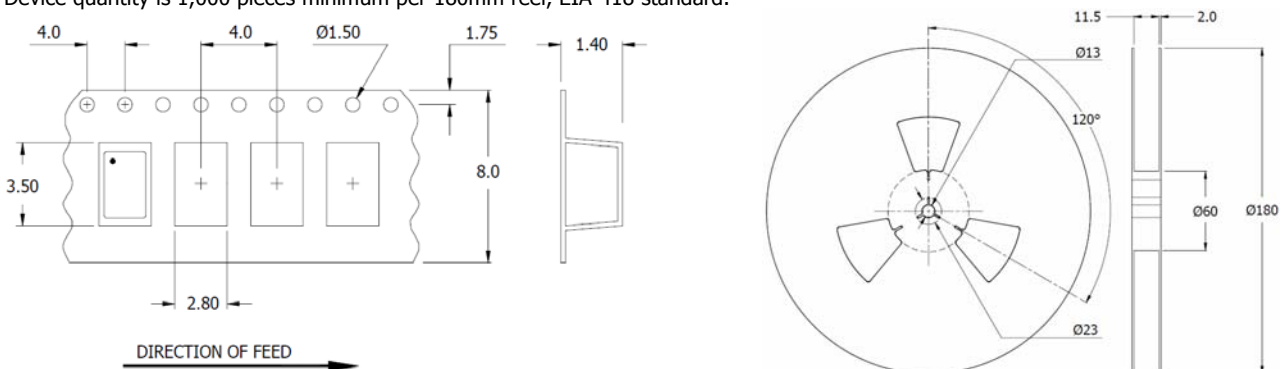
TC32L3I32K7680

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 1,000 pieces minimum per 180mm reel, EIA-418 standard.

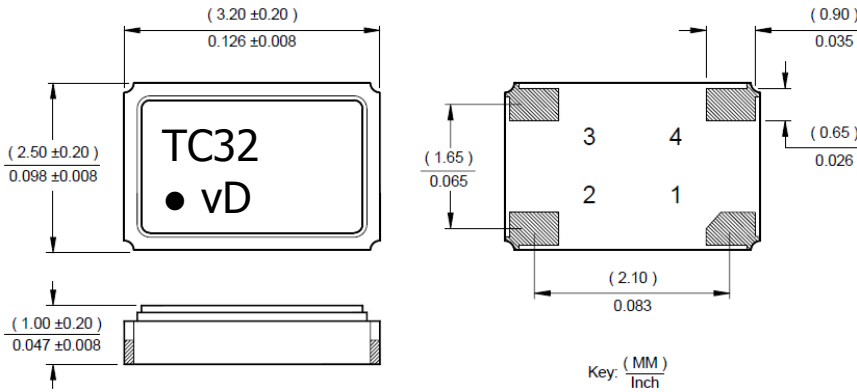


ELECTRICAL CHARACTERISTICS

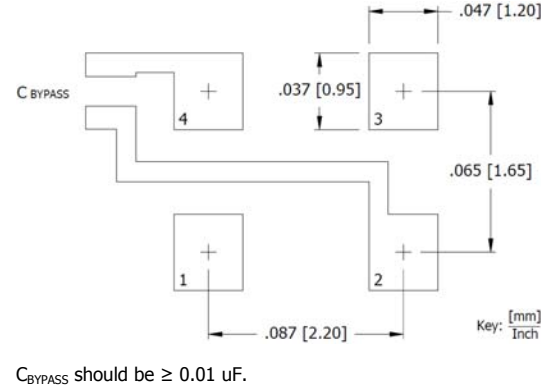
PARAMETER		SYMBOL	CONDITIONS	MIN	TYP	MAX	UNIT
ELECTRICAL PARAMETERS	Frequency	f_0			32.7680		kHz
	Operating Mode	-		AT Fundamental			-
	Output Type			CMOS			
	Supply Voltage		$\pm 10\%$	1.5, 1.8, 2.5, 3.3			V
	Current			-	-	3.0	mA
	Frequency Stability		See Ordering Information	20, 25, 50			ppm
	Operating Temperature Range	T_A		-20 -40	-	+70 +85	$^{\circ}\text{C}$
	Load Capacitance	C_L	CMOS	-	15	-	pF
	Voltage Level [V_{OH}]			$0.9V_{CC}$	-	-	V
	Voltage Level [V_{OL}]			-	-	$0.1V_{CC}$	V
	Rise and Fall Time	T_{rr}, T_f		-	-	50	ns
	Symmetry			45	-	55	%
	Start-up Time			-	5.0	10	ms
	Tri-State Voltage [V_{OL}]			$0.7V_{CC}$	-	-	V
	Tri-State Voltage [V_{OH}]			-	-	$0.3V_{CC}$	V
	Aging	$\Delta f/f_0$	@+25 $^{\circ}\text{C}$, 1st year	-	3.0	5.0	\pm ppm
	Storage Temperature Range	T_{STR}		-55	-	+125	$^{\circ}\text{C}$

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 $^{\circ}\text{C}$ 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	