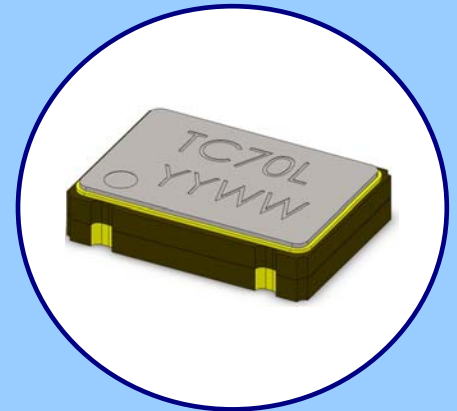


# MODEL TC70

## 32.7680KHZ CLOCK OSCILLATOR

### FEATURES

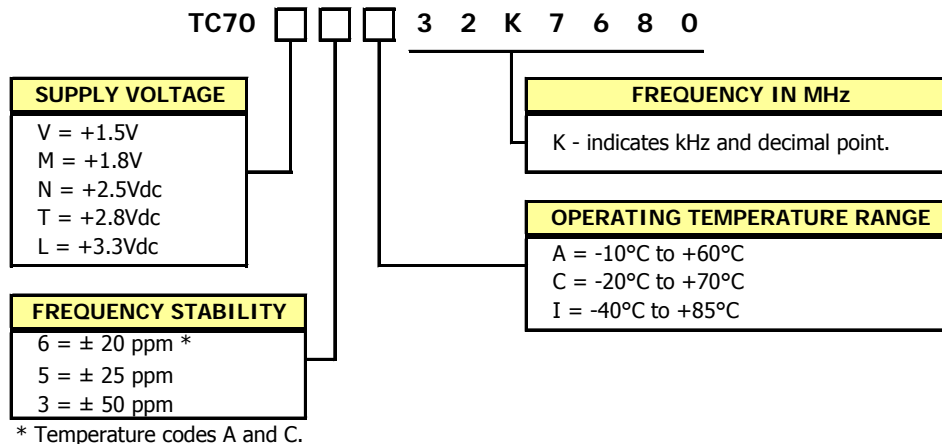
- 32.7680kHz Frequency Reference
- Package Size 7.0mm x 5.0mm
- Fundamental Crystal Design
- Hermetic Ceramic Package
- Frequency Stability,  $\pm 50$  ppm Standard
- Operating Temperature,  $-40^{\circ}\text{C}$  to  $+85^{\circ}\text{C}$  Standard
- Tape & Reel Packaging, EIA-418
- **RoHS/Green Compliant [6/6]**



### APPLICATIONS

Model TC70 is ideal for use in a wide range of communication equipment, measurement equipment, industrial applications, automotive electronics, wireless communications, PDAs and notebooks.

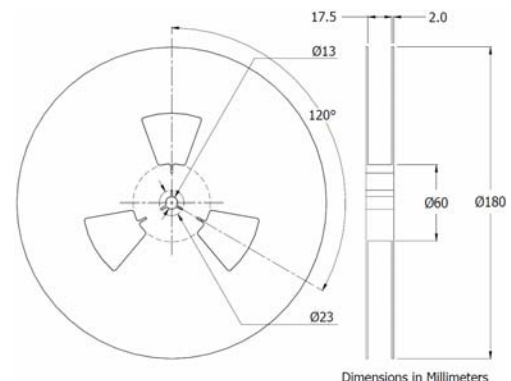
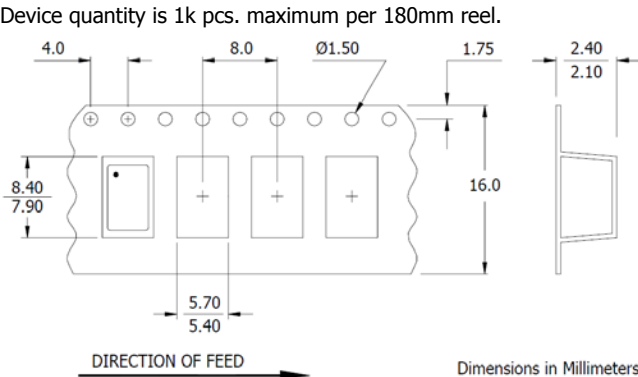
### ORDERING INFORMATION



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. maximum per 180mm reel.

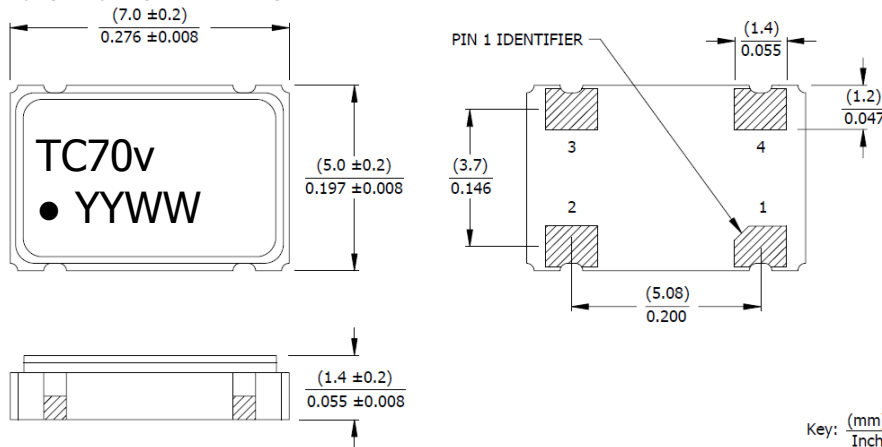


**ELECTRICAL CHARACTERISTICS**

ELECTRICAL PARAMETERS	PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNIT
	Frequency	$f_o$	-	-	-	32.7680	-
Operating Mode	-	-	-	AT Fundamental			-
Output Type	-	-	-	HCMOS			-
Supply Voltage	$V_{CC}$	$\pm 10\%$	-	1.5, 1.8, 2.5, 2.8, 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	200	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**

**TC70 PACKAGE DRAWING**



**MARKING INFORMATION**

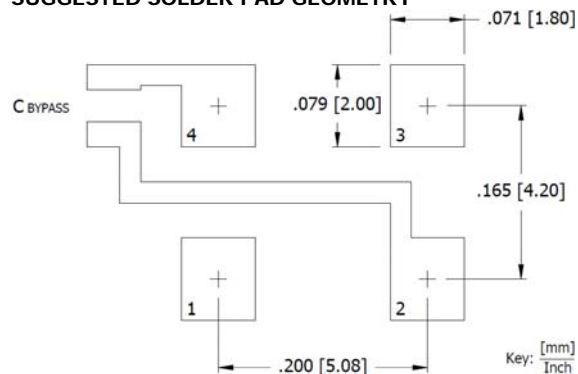
- TC70 – CTS Model Series.
- v – Voltage code.  
[L=3.3V, T=2.8V, N=2.5V, M=1.8V, V=1.5V]
- – Pin 1 identifier.
- YYWW – Date code, YY – year, WW – week.

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.

**SUGGESTED SOLDER PAD GEOMETRY**



$C_{BYPASS}$  should be  $\geq 0.01 \mu F$ .

**PIN ASSIGNMENTS**

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