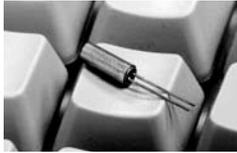
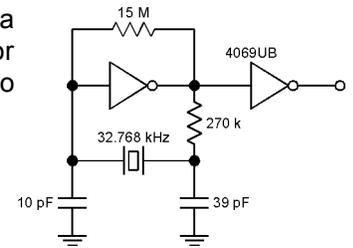


# MMCC-1, MMCC-2, and MMCC-3 Tuning Fork Crystals

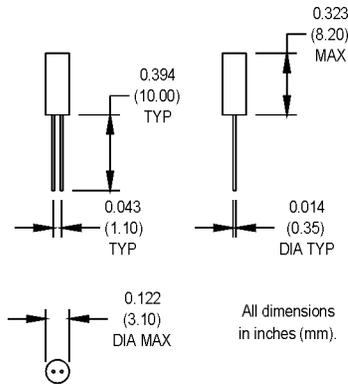


## Precision 32.768 kHz quartz crystals for realtime applications

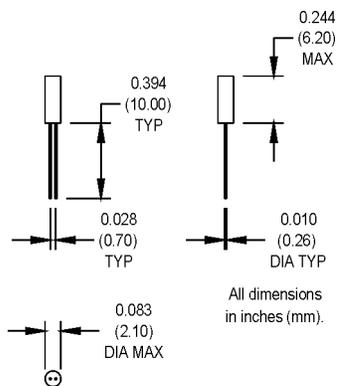
The majority of applications use a 32.768 kHz crystal in an oscillator circuit incorporating binary division to produce a 1 Hz output.



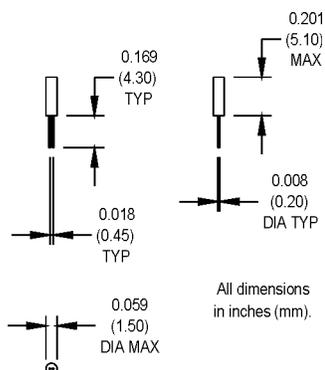
### \*MMCC-1-R



### \*MMCC-2-R



### \*MMCC-3-R

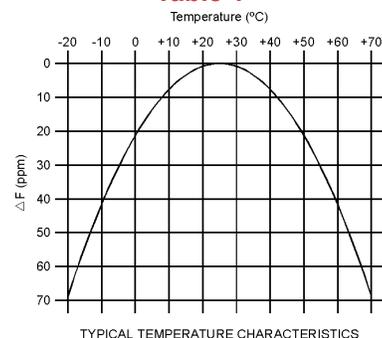


## Electrical/Environmental Specifications

| PARAMETERS                               | VALUE   |
|--|---|
| Frequency                                | 32.768 kHz  |
| Tolerance @ +25°C                        | ±30 ppm   |
| Aging                                    | ±3 ppm/yr. Max.   |
| Shunt Capacitance                        | MMCC-1: 1.60 pF, Typical<br>MMCC-2: 1.35 pF, Typical<br>MMCC-3: 1 pF, Typical |
| Load Capacitance                         | MMCC-1/MMCC-2: 12.5 pF, Typical<br>MMCC-3: 8.0 pF, Typical                    |
| Standard Operating Conditions            | See Table 1   |
| Storage Temperature                      | -40°C to +85°C  |
| Equivalent Series Resistance (ESR), Max. | MMCC-1/MMCC-2: 35K Ω<br>MMCC-3: 40K Ω   |
| Resonance                                | Parallel  |
| Quality Factor                           | 70,000 Min.   |
| Turnover Temperature                     | +25°C ±5°C  |
| Parabolic Curvature Constant             | -0.034 ppm/°C <sup>2</sup> , Typical  |
| Drive Level                              | 1.0 μW Max.   |
| Holder                                   | Compression seal  |
| Mechanical Shock                         | MIL-STD-202, Method 213, C  |
| Vibration                                | MIL-STD-202, Method 201 & 204   |
| Thermal Cycle                            | MIL-STD-883, Method 1010, B   |

\* Series resonant designated by "SR" prefix (i.e., **SRMMCC-1**).  
Use MtronPTI part number **374-005** for ± 20 ppm tolerance (MMCC-1).  
Use MtronPTI part number **375-05A** for ± 20 ppm tolerance (MMCC-2).  
Contact the factory for specifications not listed.

**Table 1**



MtronPTI reserves the right to make changes to the product(s) and service(s) described herein without notice. No liability is assumed as a result of their use or application.

Please see [www.mtronpti.com](http://www.mtronpti.com) for our complete offering and detailed datasheets. Contact us for your application specific requirements: MtronPTI 1-800-762-8800.

# MtronPTI Lead Free Solder Profile

