

## Cylindrical 'watch' crystal

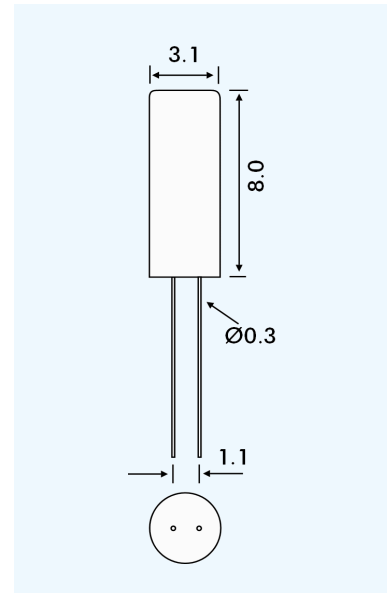
- An industry-standard source of 32.768kHz clock signals
- Fully RoHs compliant
- Excellent shock resistance and environmental capability
- A high build quality component at low cost



### SPECIFICATION

|                                |   |
|--------------------------------|---|
| Frequency:                     | 32.7680kHz  |
| Calibration Tolerance at 25°C: | from ±5ppm to ±50ppm  |
| Temperature Coefficient:       | Inverse Parabolic -0.035 ppm/°C <sup>2</sup>                  |
| Peak Temperature:              | 25°C ±5°C   |
| Operating Temperature Range:   | -20 to +70°C  |
|                                | -40 to +85° available   |
| Storage Temperature:           | -55°~+105°C   |
| Effective Series Resistance:   | 45kOhms max.  |
| Shunt Capacitance (C0):        | 0.8pF typical   |
| Motional Capacitance:          | 4.0fF max.  |
| Load Capacitance (CL):         | 6pF or 12.5pF   |
| Ageing:                        | < ±5ppm per year at +25°C                                     |
| Maximum Drive level:           | 1.0 microW max.   |
| Reflow Soldering:              | 10s maximum at 250°C twice<br>or 180s at 230°C, once.         |
| Insulation Resistance:         | 100MOhm min.  |
| Shock Resistance:              | ±5ppm max. (Drop test 3 times<br>onto a hard board from 75cm) |

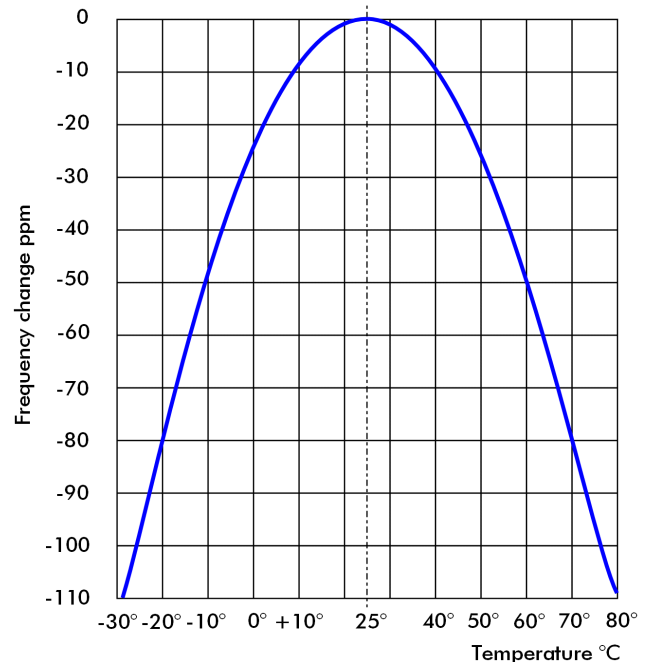
### OUTLINE & DIMENSIONS



### STOCK NUMBERS/SPECIFICATIONS

| Stock Number | Frequency | Calibration | CL (pF) |
|--------------|-----------|-------------|---------|
| MH32768A     | 32.768kHz | ±15ppm      | 12.5    |
| MH32768B     | 32.768kHz | ±20ppm      | 12.5    |
| MH32768M     | 32.768kHz | ±5ppm       | 12.5    |
| MH32768P     | 32.768kHz | ±5ppm       | 6.0     |

### Frequency Change vs. Temperature X-Cut Crystal



$$\text{Function} = \Delta f / f_0 = -0.035(T - T_0)^2 \pm 10\%$$