

# QTP9 Series

## 4.0x9.6 Plastic SMD Tuning Fork

### Features

- Excellent environmental and heat resistance plastic package with reflow capability
- Extended temperature -40 to +85°C for industrial applications

### Applications

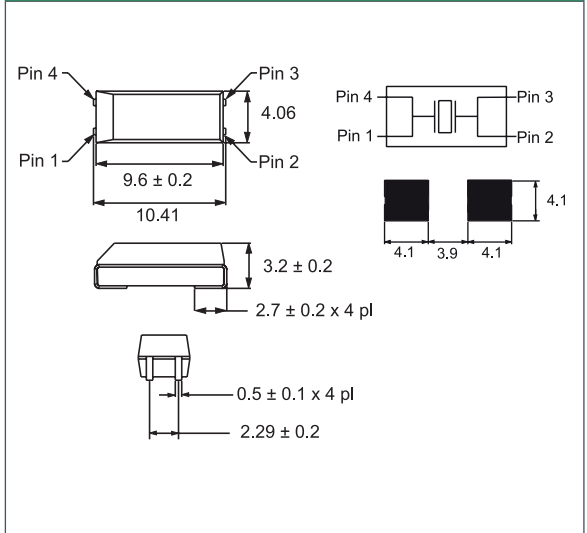
- Wide range in communication and measuring equipment
- Commercial and Industrial applications
- Wireless communications
- Time of day Applications



### General Specifications

|                                     |                                     |
|-------------------------------------|-------------------------------------|
| Nominal Frequency                   | 32.768 kHz                          |
| Frequency Tolerance at 25°C         | ±20ppm                              |
| Temperature Coefficient             | -0.035 ± 0.008ppm/Δ °C <sup>2</sup> |
| Temperature Range (Operating)       | -40 to +85°C                        |
| Storage Temperature                 | -55 to +125°C                       |
| Load Capacitance C <sub>L</sub>     | 6pF, 12.5pF                         |
| Shunt Capacitance C <sub>0</sub>    | 1.5pF typ.                          |
| Motional Capacitance C <sub>1</sub> | 3.0fF typ.                          |
| Equivalent Series Resistance (ESR)  | 50KΩ max.                           |
| Drive Level                         | 1 μW max.                           |
| Aging per Year                      | ±3ppm max.                          |
| Insulation Resistance (MΩ)          | 500 at 100Vdc ±15Vdc                |
| Quality Factor                      | 70000 typ.                          |
| Capacitance Ratio                   | 450 typ.                            |

### Mechanical Dimensions



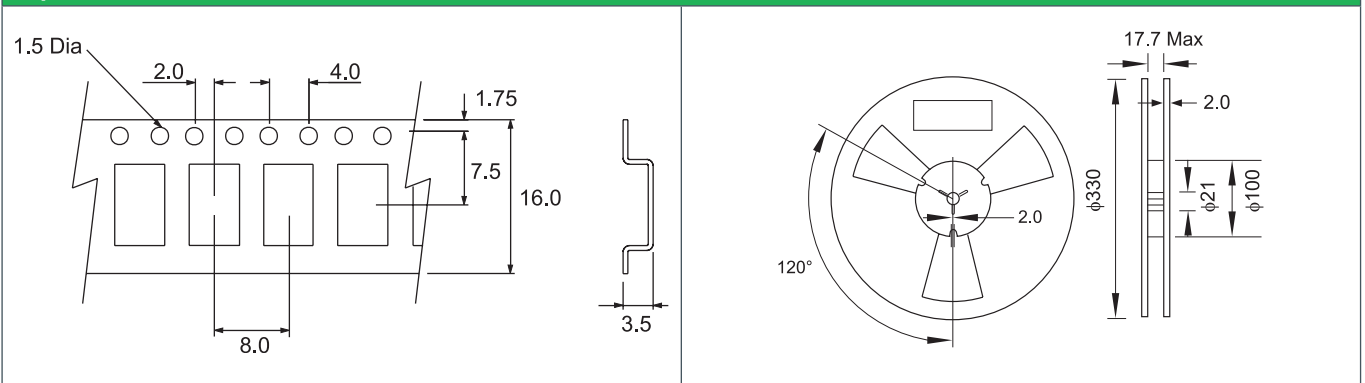
### Part Numbering Guide

| Qantek Code | Package                   | Nominal Frequency (in kHz) | Load Capacitance        | Operating Temperature Range | Frequency Tolerance                       | Packaging             |
|-------------|---------------------------|----------------------------|-------------------------|-----------------------------|-------------------------------------------|-----------------------|
| Q = Qantek  | TP9 = 4.0x9.6 Plastic SMD | 32.768                     | 06 = 6pF<br>12 = 12.5pF | <b>B = -40 to +85°C</b>     | 10 = ±10ppm<br>15 = ±15ppm<br>20 = ±20ppm | R = 3000pcs Tape&Reel |

Example: QTP932.76812B20R

bold letters = recommended standard specification

### Tape and Reel Dimensions



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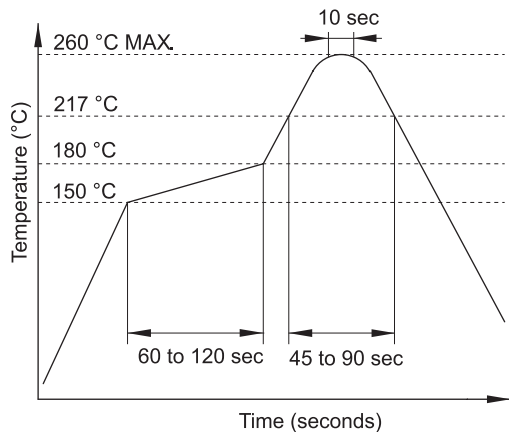
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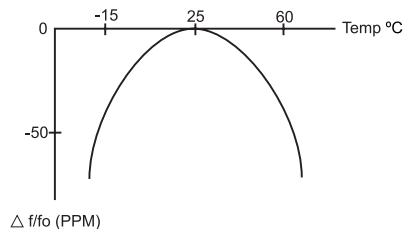
### Marking Code Guide

Contains manufacturer code / lot code

### Solder Reflow Profile



### Frequency vs. Temperature Characteristics



To calculate the frequency stability the parabolic curvature constant (K) is needed. For calculating the stability at 45°C?

1- Change in temperature ( $\Delta T$ ) is  $(45-25) = +20^\circ\text{C}$

2- Change in frequency is  $(-0.034 \times (\Delta^\circ\text{C})^2) = (-0.035 \times (20)^2) = -14.0\text{ppm}$