

Features

Frequency range : 32.768 kHz
 SMD : Ceramic package
 External dimensions (mm)
 L : 1.2 x W : 1.0 x H : 0.35
 RoHS compliant & Pb free

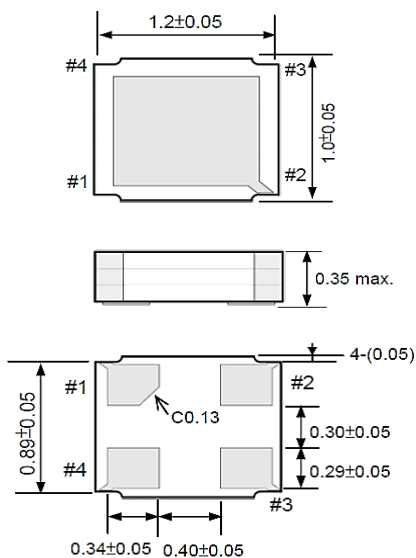
Applications

Smart phone
 Wearable devices
 Compact portable devices
 Internet of Things (IoT)
 Ultra-low power MCU's, SoC's
 Wireless modules

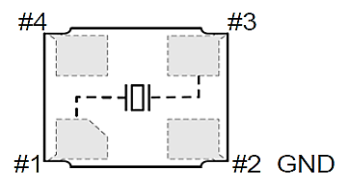
Electrical Characteristics

| Item | Symbol | 9HT13 | Conditions |
|-----------------------------|----------------|---|--|
| Nominal Frequency | f_0 | 32.768 kHz | |
| Frequency Tolerance | $\Delta f/f_0$ | ± 20 ppm | at $25^\circ\text{C} \pm 3^\circ\text{C}$ |
| Load Capacitance | C_L | 6pF, 7pF, 12.5pF | |
| Operating Temperature Range | T_{OTR} | $-40^\circ\text{C} \sim +85^\circ\text{C}$ | |
| Storage Temperature Range | T_{STR} | $-55^\circ\text{C} \sim +125^\circ\text{C}$ | |
| Turnover Temperature | T_M | $25^\circ\text{C} \pm 5^\circ\text{C}$ | |
| Temperature Coefficient | β | -0.039 ppm/ $^\circ\text{C}^2$ Max. | |
| Motional Capacitance | C_1 | 7.0 fF Typ. | |
| Motional Resistance (ESR) | R_1 | 90 k Ω Max. | at $25^\circ\text{C} \pm 3^\circ\text{C}$ |
| Drive Level | D_L | 0.1 μW Typ. / 0.5 μW Max. | |
| Aging | $\Delta f/f_0$ | ± 3 ppm Max. | at $25^\circ\text{C} \pm 3^\circ\text{C}$, first year |
| Shunt Capacitance | C_0 | 1.5 pF Typ. | |

Dimensions

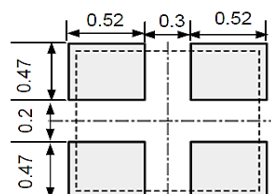


Top View Crystal Connection



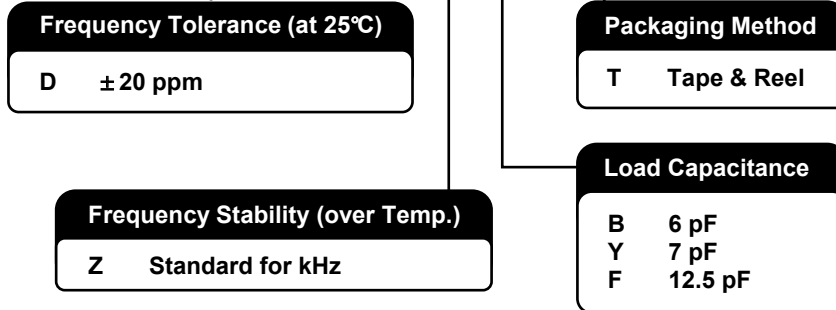
2 : Connect to the lid (GND)
 # 4 : No connect

Recommended pad layout

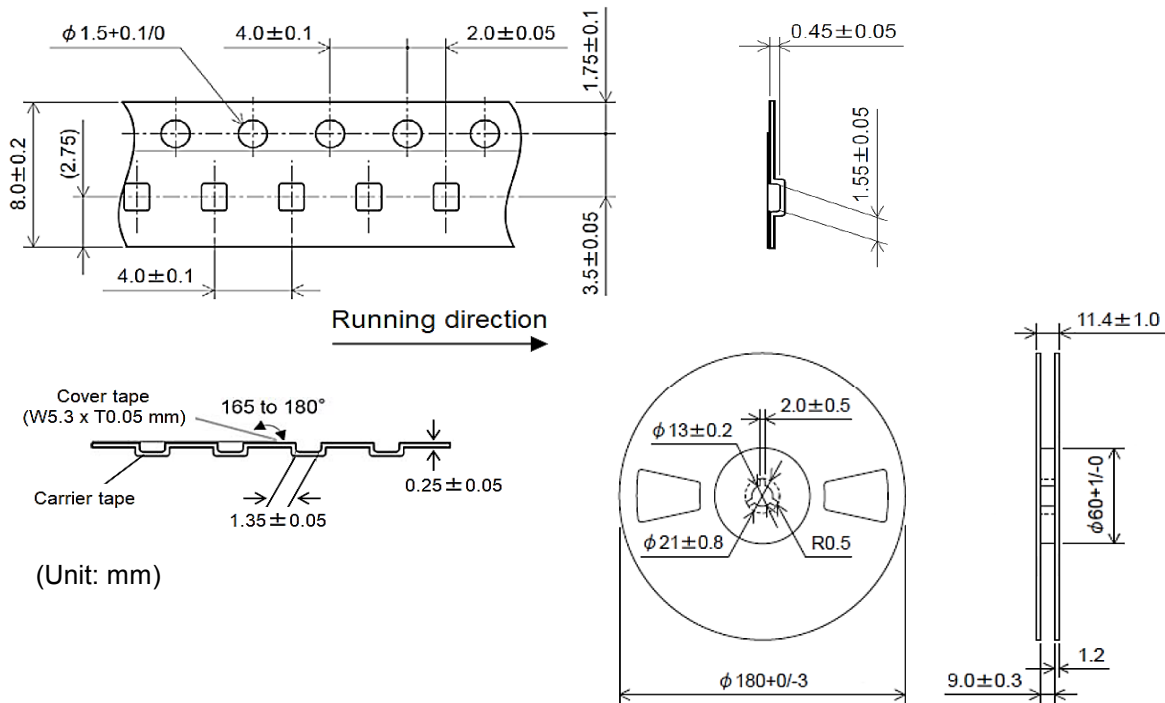


Ordering Information

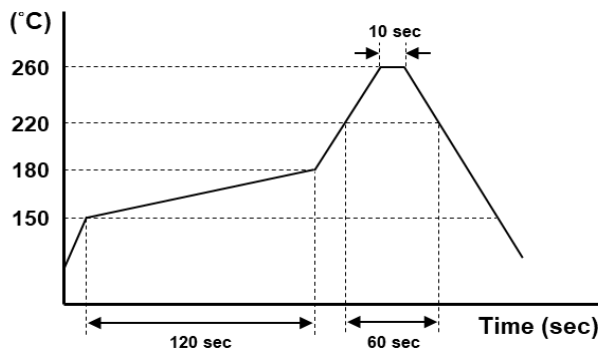
9HT13 - 32.768K D Z F - T



Packing



Reflow Profile



Total time : Max. 200 sec.
Solder melting point : 220°C