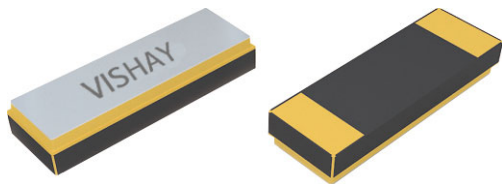


## Surface-Mount Crystal



The XT10 series is an ultra miniature package crystal with dimensions 1.2 mm x 1.0 mm x 0.32 mm. It is primarily used in miniature applications such as mobile communications, gaming, bluetooth, wearable health products, portable test equipment, and size limited products.

### FEATURES

- Size: 3.2 x 1.5 x 0.8 (mm)
- Ultra small SMD package
- Tuning fork crystal
- Frequency: 32.768 kHz
- Tape and reel packaging
- Material categorization:  
for definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)

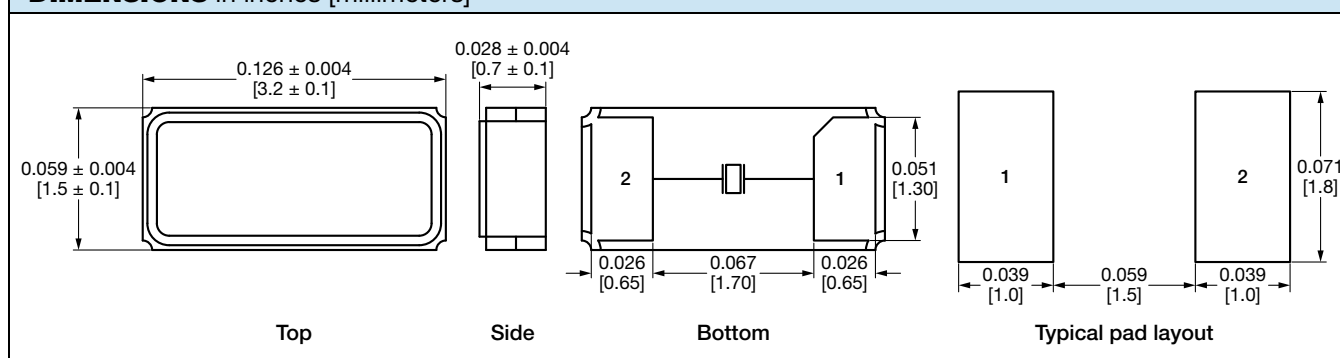


**RoHS**  
COMPLIANT  
HALOGEN  
**FREE**  
**GREEN**  
(5-2008)

### STANDARD ELECTRICAL SPECIFICATIONS

| PARAMETER                    | SYMBOL         | CONDITION           | UNIT                | MIN. | TYP.               | MAX. |
|------------------------------|----------------|---------------------|---------------------|------|--------------------|------|
| Frequency range              | $F_O$          |                     | kHz                 | -    | 32.768             | -    |
| Frequency tolerance          | $\Delta F/F_O$ | At 25 °C            | ppm                 | -    | $\pm 20$           | -    |
| Turnover temperature         |                |                     | °C                  | -    | $25 \pm 5$         | -    |
| Temperature coefficient      |                |                     | ppm/°C <sup>2</sup> | -    | $-0.036 \pm 0.005$ | -    |
| Operating temperature range  | $T_{OPR}$      | Standard            | °C                  | 0    | -                  | +70  |
|                              |                | Optional            | °C                  | -40  | -                  | +85  |
| Storage temperature range    | $T_{STG}$      |                     | °C                  | -55  | -                  | +125 |
| Shunt capacitance            | $C_0$          |                     | pF                  | -    | -                  | 1.5  |
| Load capacitance             | $C_L$          | Customer specified  | pF                  | -    | 7, 9, or 12.5      | -    |
| Insulation resistance        | $I_R$          | 100 V <sub>DC</sub> | MΩ                  | 500  | -                  | -    |
| Equivalent series resistance | ESR            |                     | kΩ                  | -    | -                  | 70   |
| Drive level                  | $D_L$          |                     | μW                  | -    | 10                 | 200  |
| Aging                        | $F_a$          | At 25 °C, per year  | ppm                 | -3   | -                  | +3   |

### DIMENSIONS in inches [millimeters]





**PART NUMBER CONFIGURATIONS** (to be used on all New Designs)

|          |          |                |          |                          |          |                   |  |  |          |   |   |          |          |          |          |                    |
|----------|----------|----------------|----------|--------------------------|----------|-------------------|--|--|----------|---|---|----------|----------|----------|----------|--------------------|
| <b>X</b> | <b>T</b> | <b>1</b>       | <b>3</b> | <b>0</b>                 | <b>9</b> | <b>H</b>          | <b>G</b>   | <b>R</b>   | <b>X</b> | <b>X</b>  | <b>3</b>  | <b>2</b> | <b>K</b> | <b>7</b> | <b>6</b> | <b>E</b>           |
| Crystal  |          | Package / Size |          | Load. Cap.               |          | Pack Code         | Freq. Tolerance  | Operating Temp.  |          | Options   | Frequency   |          |          |          |          | Lead (PB)-free     |
|          |          | 13             |          | 09 = std.<br>SE = series |          | H = tape and reel | G = $\pm 30$ ppm<br>E = $\pm 25$ ppm<br>H = $\pm 20$ ppm<br>I = $\pm 15$ ppm<br>J = $\pm 10$ ppm | S = $-10^{\circ}\text{C}$ to $+70^{\circ}\text{C}$<br>R = $-40^{\circ}\text{C}$ to $+85^{\circ}\text{C}$ |          | X = no options<br><br>Contact factory for available options | Use "K" as decimal place holder<br><br>Frequency must be five digits - complete with "0" at the end |          |          |          |          | E = lead (Pb)-free |

**PART MARKING**

|         |                            |
|---------|----------------------------|
| Line 1: | V250 (frequency)           |
| Line 2: | YWWA (date code / factory) |



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