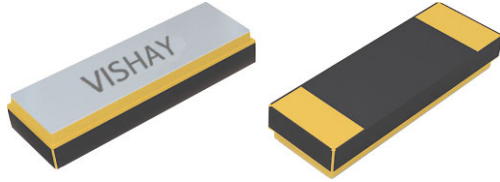


## Surface-Mount Crystal



The XT13 series is an ultra miniature package crystal with dimensions 3.2 mm x 1.5 mm x 0.70 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)

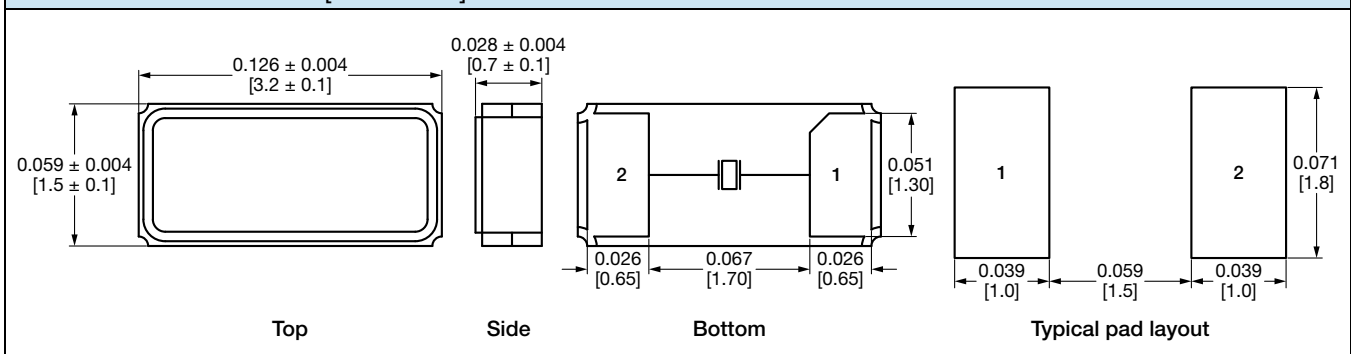


**RoHS**  
COMPLIANT  
HALOGEN  
**FREE**  
**GREEN**  
(5-2008)

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

**PART MARKING**

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



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