

## Low Profile SMD Type Crystal Units



### FEATURES

- Low cost
- Industry standard
- Wide frequency range
- Excellent aging
- Surface-mount
- Material categorization: for definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)


**RoHS**  
COMPLIANT

### Note

- Not compatible with vapor phase reflow mounting

This part is a miniature AT cut strip crystal unit packaged for surface mounting.

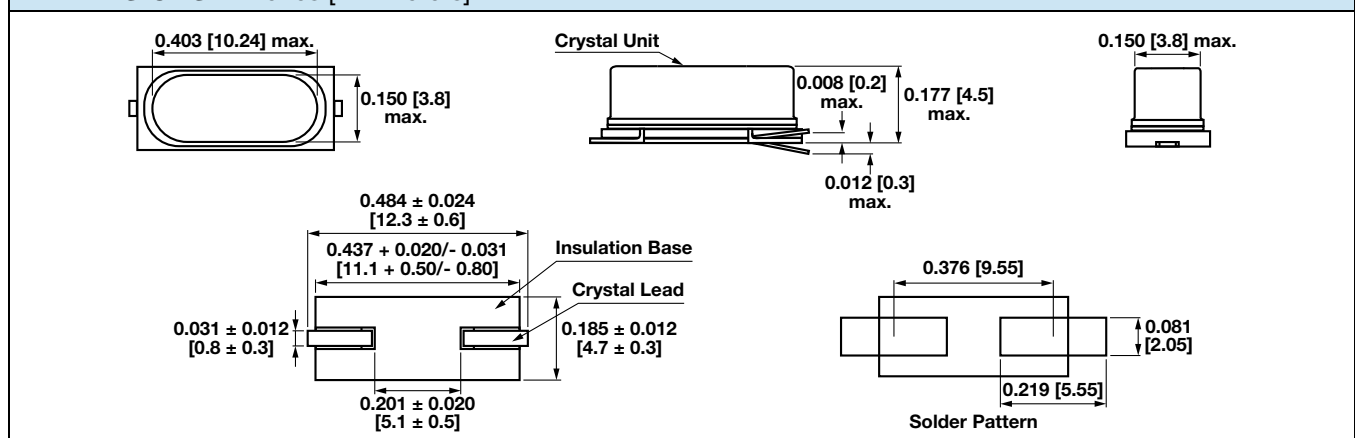
### STANDARD ELECTRICAL SPECIFICATIONS

PARAMETER	SYMBOL	CONDITION	UNIT	MIN.	TYP.	MAX.
Frequency range	$F_O$		MHz	3.579545	-	66.000
Frequency tolerance	$\Delta F/F_O$	At 25 °C	ppm	-30	-	+30
Temperature stability	$T_C$	Ref. to 25 °C	ppm	-50	-	+50
Operating temperature range	$T_{OPR}$		°C	-10	-	+70
Storage temperature range	$T_{STG}$		°C	-55	-	+125
Shunt capacitance	$C_0$		pF	-	-	7
Load capacitance	$C_L$	Customer specified	pF	10	-	Series
Insulation resistance	$I_R$	100 V <sub>DC</sub>	MΩ	500	-	-
Drive level	$D_L$		μW	-	100	500
Aging	$F_a$	At 25 °C, per year	ppm	-5	-	+5

### EQUIVALENT SERIES RESISTANCE (ESR) AND MODE OF VIBRATION (MODE)

FREQUENCY RANGE (MHz)	MAX. ESR (Ω)	MODE	FREQUENCY RANGE (MHz)	MAX. ESR (Ω)	MODE
3.579 to 3.999	200	Fundamental/AT	10.000 to 13.999	80	Fundamental/AT
4.000 to 4.999	150	Fundamental/AT	14.000 to 39.999	50	Fundamental/AT
5.000 to 5.999	120	Fundamental/AT	40.000 to 66.999	80	3 <sup>rd</sup> overtone
6.000 to 9.999	100	Fundamental/AT			

### DIMENSIONS in inches [millimeters]





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

<b>X</b>	<b>T</b>	<b>4</b>	<b>9</b>	<b>M</b>	<b>2</b>	<b>0</b>	<b>A</b>	<b>J</b>	<b>R</b>	<b>G</b>	<b>X</b>	<b>8</b>	<b>M</b>	<b>1</b>	<b>9</b>	<b>2</b>	<b>E</b>
Crystal	Package / Size		Load Cap.		Pack Code		Freq. Tolerance		Operating Temp.		Temp. Stability		Options		Frequency		Lead (Pb)-free
	49 M		20 = std. SE = series		A = bulk H = tape and reel		G = ± 30 ppm E = ± 25 ppm H = ± 20 ppm I = ± 15 ppm J = ± 10 ppm		S = -10 °C to +70 °C R = -40 °C to +85 °C		C = ± 100 ppm D = ± 50 ppm F = ± 35 ppm G = ± 30 ppm E = ± 25 ppm H = ± 20 ppm		X = no options  Contact factory for available options		Use "M" as decimal place holder  Frequency must be five digits - complete with "0" at the end		E = lead (Pb)-free

Previous / legacy part number information: still valid for existing designs;  
**all New Designs should use the new part configuration above**

**PREVIOUS / LEGACY GLOBAL PART NUMBERING**

<b>X</b>	<b>T</b>	<b>9</b>	<b>M</b>	<b>2</b>	<b>0</b>	<b>A</b>	<b>N</b>	<b>A</b>	<b>4</b>	<b>0</b>	<b>M</b>
<b>MODEL NUMBER</b>				<b>LOAD CAPACITANCE</b>		<b>PACKAGE CODE</b>		<b>OPTIONS</b>		<b>FREQUENCY</b>	
XT9M = XT49M				18 = 18 pF 20 = 20 pF NL = series to be specified by customer		Tape and reel H = RF7 (XT9M)  Bulk A = B04 (all models)		NA = no additional options RR = extended temperature of -40 °C to +85 °C Contact factory for all other options		4M = 4 MHz 40M = 40 MHz 100M = 100 MHz 12M288 = 12.288 MHz "M" is used as decimal place holder in frequency	
<b>XT49M</b> MODEL				<b>R</b> OTR blank = standard R = -40 °C to +85 °C		<b>-20</b> LOAD blank = series -20 = 20 pF standard -30 = 30 pF -32 = 32 pF		<b>12M</b> FREQUENCY/MHz		<b>e2</b> JEDEC® LEAD (Pb)-FREE STANDARD	



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