

## Low Profile Holder Type Crystal Units



### FEATURES

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


**RoHS**  
COMPLIANT

This part is a miniature AT cut strip crystal unit with a low profile package. It is with resistance weld.

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 (first year)	$F_a$	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 66.000	80	3 <sup>rd</sup> overtone
6.000 to 9.999	100	fundamental/AT			

DIMENSIONS in inches [millimeters]	
<p>0.403 [10.24] max. 0.500 [12.7] min. 0.192 ± 0.008 [4.88 ± 0.2]</p>	<p>0.150 [3.81] max. 0.138 [3.5] max. Ø 0.017 ± 0.002 [0.43 ± 0.05]</p>
<p>0.435 [11.05] max. 0.183 [4.65] max.</p>	



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

<b>X</b>	<b>T</b>	<b>4</b>	<b>9</b>	<b>S</b>	<b>2</b>	<b>0</b>	<b>H</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 S		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>S</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>	
XT9S = XT49S				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>XT49S</b>	<b>R</b>	<b>-20</b>	<b>SP</b>	<b>12M</b>	<b>e2</b>						
MODEL	OTR blank = standard R = -40 °C to +85 °C	LOAD blank = series -16 = 16 pF -20 = 20 pF standard -30 = 30 pF -32 = 32 pF	OPTIONS blank = standard SP = spacer SL = sleeve	FREQUENCY/MHz	JEDEC® LEAD (Pb)-FREE STANDARD						



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