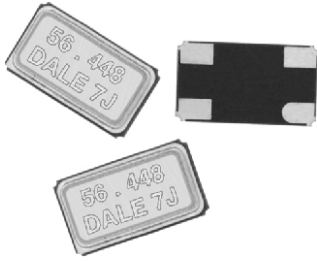


## Surface-Mount Crystal



### FEATURES

- Ultra-miniature size: 6.0 x 3.5 x 1.0 (mm)
- Seam sealing
- Ceramic package
- Emboss tapping
- Reflow soldering
- Material categorization: for definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)


**RoHS**  
COMPLIANT

This part is an ultra miniature package with size of 6.0 mm x 3.5 mm x 1.0 mm. With its ceramic base and metal cover it provides the durability and reliability necessary for strenuous process like infrared and vapor phase reflow.

STANDARD ELECTRICAL SPECIFICATIONS						
PARAMETER	SYMBOL	CONDITION	UNIT	MIN.	TYP.	MAX.
Frequency range	$F_O$		MHz	10.000	-	30.000
Frequency tolerance	$\Delta F/F_O$	At 25 °C	ppm	-	$\pm 10, \pm 15, \pm 20, \pm 25, \pm 30$	-
Temperature stability	$T_C$	Ref. to 25 °C	ppm	-	$\pm 20, \pm 25, \pm 30, \pm 35, \pm 50, \pm 100$	-
Operating temperature range	$T_{OPR}$		°C	-10	-	+60
Storage temperature range	$T_{STG}$		°C	-40	-	+85
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	-	10	100
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
10.000 to 11.999	60	Fundamental	19.000 to 19.999	40	Fundamental
12.000 to 12.099	50	Fundamental	20.000 to 29.999	35	Fundamental
13.000 to 18.999	45	Fundamental	30.000	30	Fundamental

DIMENSIONS in inches [millimeters]	
	<p><b>Note</b> Pin #2 and pin #4 are connected through cover, in case connected to GND. Frequency might be drifted.</p>



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

<b>X T</b>	<b>4 6</b>	<b>2 0</b>	<b>H</b>	<b>J</b>	<b>R</b>	<b>G</b>	<b>X</b>	<b>8 M 1 9 2</b>	<b>E</b>
Crystal	Package / Size <b>46</b>	Load Cap. <b>10</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	Temp. Stability <b>C</b> = ± 100 ppm <b>D</b> = ± 50 ppm <b>F</b> = ± 35 ppm <b>G</b> = ± 30 ppm <b>E</b> = ± 25 ppm <b>H</b> = ± 20 ppm	Options <b>X</b> = no options  Contact factory for available options	Frequency Use "M" as decimal place holder  Frequency must be five digits - complete with "0" at the end	Lead (Pb)-free  <b>E</b> = 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 T 9 S</b>	<b>2 0</b>	<b>A</b>	<b>N A</b>	<b>4 0 M</b>
<b>MODEL NUMBER</b> XT9C = XT49C	<b>LOAD CAPACITANCE</b> 18 = 18 pF 20 = 20 pF NL = series to be specified by customer	<b>PACKAGE CODE</b> Tape and reel G = RF5 (XT9S) H = RF7 (XT9M)  Bulk A = B04	<b>OPTIONS</b> NA = no additional options RR = extended temperature of -40 °C to +85 °C Contact factory for all other options	<b>FREQUENCY</b> 4M = 4 MHz 40M = 40 MHz 100M = 100 MHz 12M288 = 12.288 MHz M is used as decimal place holder in frequency
<b>XT49C</b> MODEL	<b>-20</b> LOAD blank = series -20 = 20 pF standard -32 = 32 pF		<b>25M</b> FREQUENCY/MHz	<b>e4</b> JEDEC® LEAD (Pb)-FREE STANDARD



## Disclaimer

ALL PRODUCT, PRODUCT SPECIFICATIONS AND DATA ARE SUBJECT TO CHANGE WITHOUT NOTICE TO IMPROVE RELIABILITY, FUNCTION OR DESIGN OR OTHERWISE.

Vishay Intertechnology, Inc., its affiliates, agents, and employees, and all persons acting on its or their behalf (collectively, "Vishay"), disclaim any and all liability for any errors, inaccuracies or incompleteness contained in any datasheet or in any other disclosure relating to any product.

Vishay makes no warranty, representation or guarantee regarding the suitability of the products for any particular purpose or the continuing production of any product. To the maximum extent permitted by applicable law, Vishay disclaims (i) any and all liability arising out of the application or use of any product, (ii) any and all liability, including without limitation special, consequential or incidental damages, and (iii) any and all implied warranties, including warranties of fitness for particular purpose, non-infringement and merchantability.

Statements regarding the suitability of products for certain types of applications are based on Vishay's knowledge of typical requirements that are often placed on Vishay products in generic applications. Such statements are not binding statements about the suitability of products for a particular application. It is the customer's responsibility to validate that a particular product with the properties described in the product specification is suitable for use in a particular application. Parameters provided in datasheets and / or specifications may vary in different applications and performance may vary over time. All operating parameters, including typical parameters, must be validated for each customer application by the customer's technical experts. Product specifications do not expand or otherwise modify Vishay's terms and conditions of purchase, including but not limited to the warranty expressed therein.

Hyperlinks included in this datasheet may direct users to third-party websites. These links are provided as a convenience and for informational purposes only. Inclusion of these hyperlinks does not constitute an endorsement or an approval by Vishay of any of the products, services or opinions of the corporation, organization or individual associated with the third-party website. Vishay disclaims any and all liability and bears no responsibility for the accuracy, legality or content of the third-party website or for that of subsequent links.

Vishay products are not designed for use in life-saving or life-sustaining applications or any application in which the failure of the Vishay product could result in personal injury or death unless specifically qualified in writing by Vishay. Customers using or selling Vishay products not expressly indicated for use in such applications do so at their own risk. Please contact authorized Vishay personnel to obtain written terms and conditions regarding products designed for such applications.

No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted by this document or by any conduct of Vishay. Product names and markings noted herein may be trademarks of their respective owners.