

## Low Profile SMD Type Crystal Units



### FEATURES

- Low cost
- Industry standard
- Wide frequency range
- Excellent aging
- Surface mount
- Compliant to RoHS directive 2002/95/EC


**RoHS**  
COMPLIANT

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

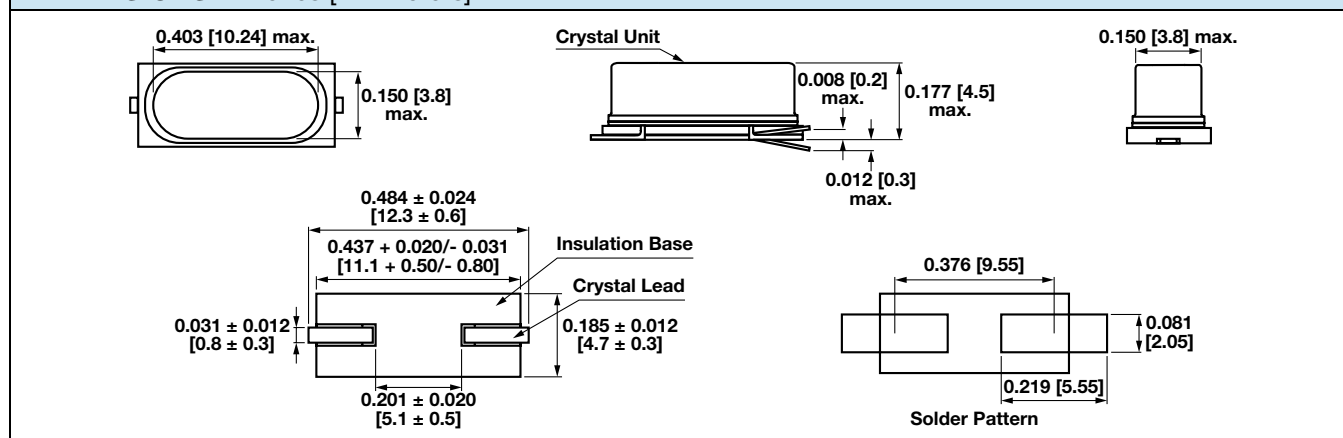
### STANDARD ELECTRICAL SPECIFICATIONS

PARAMETER	SYMBOL	CONDITION	UNIT	MIN.	TYP.	MAX.
Frequency range	$F_0$		MHz	3.579545	-	66.000
Frequency tolerance	$\Delta F/F_0$	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]



## ORDERING INFORMATION

XT49M	R	-20	20M	e2
MODEL	OTR blank = standard R = - 40 °C to + 85 °C	LOAD blank = series -20 = 20 pF -30 = 30 pF -32 = 32 pF	FREQUENCY/MHz	JEDEC LEAD (Pb)-FREE STANDARD

## GLOBAL PART NUMBER

X	T	9	M	2	0	A	N	A	2	0	M
MODEL				LOAD		PACKAGE CODE	OPTION		FREQUENCY		

## GLOBAL PART NUMBERING

X	T	9	S	2	0	A	N	A	4	0	M
<b>MODEL NUMBER</b> XT9S = XT49S XT9M = XT49M XTU1 = XTUM1				<b>LOAD CAPACITANCE</b> 18 = 18 pF 20 = 20 pF NL = series to be specified by customer		<b>PACKAGE CODE</b> <b>Tape and reel</b> G = RF5 (XT9S) H = RF7 (XT9M) <b>Bulk</b> A = B04 (all models)		<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	
Example: XT49S-20 40M											
X	T	3	6	2	0	A			1	2	M
<b>MODEL NUMBER</b> XT46 = XT46C XT36 = XT36C				<b>LOAD CAPACITANCE</b> 18 = 18 pF 20 = 20 pF NL = series to be specified by customer		<b>PACKAGE CODE</b> <b>Tape and reel</b> H = RF7 <b>Bulk</b> A = B04 (all models)		<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			
Example: XT36C-20 12M											



## 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.

Except as expressly indicated in writing, Vishay products are not designed for use in medical, life-saving, or life-sustaining applications or for any other application in which the failure of the Vishay product could result in personal injury or death. Customers using or selling Vishay products not expressly indicated for use in such applications do so at their own risk and agree to fully indemnify and hold Vishay and its distributors harmless from and against any and all claims, liabilities, expenses and damages arising or resulting in connection with such use or sale, including attorneys fees, even if such claim alleges that Vishay or its distributor was negligent regarding the design or manufacture of the part. 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.