

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 _{DC} | 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 rd 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 | | | |
| MODEL | | | | 2 | 0 | |
| | | | | LOAD | | |
| | | | | A | | |
| | | | | PACKAGE CODE | | |
| | | | | N | A | |
| | | | | OPTION | | |
| | | | | 2 | 0 | M |
| | | | | FREQUENCY | | |

| GLOBAL PART NUMBERING | | | | | |
|---|---|---|---|--|---|
| X | T | 9 | S | | |
| MODEL NUMBER | | | | 2 | 0 |
| LOAD CAPACITANCE | | | | PACKAGE CODE | |
| OPTIONS | | | | FREQUENCY | |
| <p>XT9S = XT49S XT9M = XT49M XTU1 = XTUM1</p> | | | | <p>18 = 18 pF 20 = 20 pF NL = series to be specified by customer</p> | |
| <p>NA = no additional options RR = extended temperature of - 40 °C to + 85 °C Contact factory for all other options</p> | | | | <p>4M = 4 MHz 40M = 40 MHz 100M = 100 MHz 12M288 = 12.288 MHz M is used as decimal place holder in frequency</p> | |
| <p>Example: XT49S-20 40M</p> | | | | | |
| X | T | 3 | 6 | | |
| MODEL NUMBER | | | | 2 | 0 |
| LOAD CAPACITANCE | | | | PACKAGE CODE | |
| FREQUENCY | | | | | |
| <p>XT46 = XT46C XT36 = XT36C</p> | | | | <p>18 = 18 pF 20 = 20 pF NL = series to be specified by customer</p> | |
| <p>Tape and reel H = RF7</p> | | | | <p>4M = 4 MHz 40M = 40 MHz 100M = 100 MHz 12M288 = 12.288 MHz M is used as decimal place holder in frequency</p> | |
| <p>Example: XT36C-20 12M</p> | | | | | |



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.