




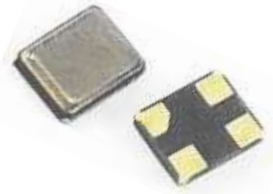
| | | |
|-------------------------------------|---|---|
| SPECIFICATION SHEET NO. | S0409 - XF24M00000S416 | |
| ORIGINAL MFG/PART NO. | TGS Crystals/CM32 24M0A10-16-30-40-60 TLF | |
| NEXTGEN PART CODE | XF24M00000S416 | Indicate This Code For RFQ/ Order |
| DATE | Apr. 9, 2025 | |
| REVISION | A2 | Updated With Most Recent Data |
| DESCRIPTION AND MAIN PARAMETRICS | MHz SMD Crystal 4 pads, XF series, Seam Seal, Dimension L3.2*W2.5*H0.7mm 24.000MHz, Tolerance ± 10 ppm, Load Capacitor 16pF Frequency stability ± 30 ppm; Operating Temp. Range -40°C ~+85°C ESR 60ohm Max, Reflow Profile Condition 260 °C Max. Package in Tape/Reel, 3000pcs/Reel RoHS/RoHS III Compliant | |
| CUSTOMER | | |
| CUSTOMER PART NUMBER | | |
| CROSS REF. PART NUMBER | | |
| MEMO | | |

| | | |
|------------------------------|---|---|
| VENDOR APPROVE | | |
| Issued/Checked/Approved |  |  |
| | |  |
| Effective Date: Apr. 9, 2025 | | |

| |
|------------------|
| CUSTOMER APPROVE |
| |
| Date: |

MAIN FEATURE

- MHz SMD Crystal L3.2*W2.5*H0.7mm 4 Pads
- Low Cost, High Precision, High Frequency Stability
- Short Lead time
- Reflow Profile Condition 260 ° C Max.
- Cross More Competitors Part
- REACH/RoHS/RoHS III Compliant



*Image shown is a representation only.
Exact specifications should be
obtained from the product dimension.*

APPLICATION

- Bluetooth, Wireless Communication Set
- Communication Electronics



ELECTRICAL CHARACTERISTICS

- See Page 6~10 For Different Part Code.
- All Products Parameters are Subject To NextGen Components' Final Confirmation.

HOW TO ORDER

- Please Follow Up Part Code Guide And Indicate NextGen Part Code XF24M00000S416 For RFQ and Order.

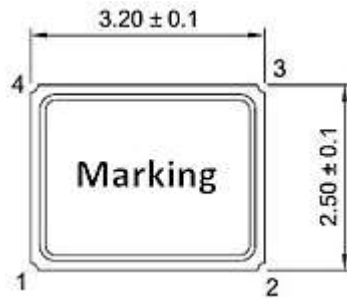
PART CODE GUIDE

RFQ
[Request For Quotation](#)

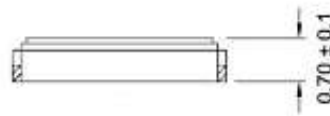
| CODE | NAME | KEY SPECIFICATION OPTION |
|----------|-----------------------------------|---|
| XF | Product Series Code | MHz SMD Crystal, Seam Seal, 4 Pads Case Dimension L3.2*W2.5*H0.7mm |
| 24M0 | Frequency Range Code | 24M0: 24.0MHz |
| 0000S416 | Internal Control Code | Letter A~Z, a~z or digits (0~9) |
| XX | Special/Custom Parameters Code | Blank: N/A XX: Letter A~Z, a~z or digits (0~9) for Special/Custom Parameters |

DIMENSION - Unit: mm

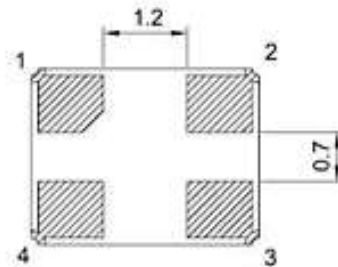
Top View



Side View

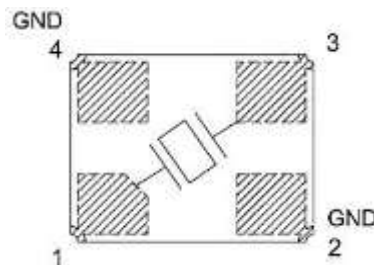


Bottom View

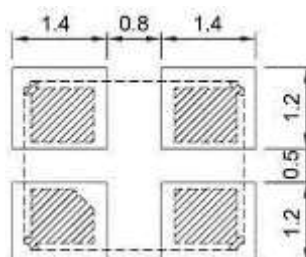


Connection

- #1 Crystal
- #2 Ground
- #3 Crystal
- #4 Ground



Recommend Pad Layout



GENERAL SPECIFICATION

| PARAMETER | SYMBOL | VALUE | | | UNIT | CONDITION |
|------------------------|--------|-------------|------|------|------|---------------|
| | | MIN. | TYPE | MAX. | | |
| Mode of Vibration Code | | Fundamental | | | | |
| Frequency Tolerance | △F/F0 | ± 10 | - | ± 50 | ppm | at 25°C±3°C |
| Load Capacitance | CL | 7 | - | 20 | pF | |
| Frequency Stability | Tc | ± 10 | - | ± 50 | ppm | |
| Operating Temp. Range | TOPR | -40 | - | +125 | °C | |
| Storage Temp. Range | TSTG | -55 | - | +125 | °C | |
| Drive Level | DL | - | - | 100 | μW | |
| Insulation Resistance | IR | 500 | - | | mΩ | @100V ± 15VDC |
| Shunt Capacitance | C0 | - | - | 3.0 | pF | |
| Aging per year | Fa | -3 | - | +3 | ppm | 1st Year |

ELECTRICAL PARAMETERS – FOR DIFFERENT PART CODE- Ta = 25°C

| PART CODE | FREQUENCY RANGE | FREQUENCY TOLERANCE | LOAD CAPACITANCE | FREQUENCY STABILITY | OPERATING TEMPE. RANGE | EQUIVALENT SERIES RESISTANCE |
|-----------------|-----------------|---------------------|------------------|---------------------|------------------------|------------------------------|
| | MHz | ppm | pF | ppm | °C | Ω Max. |
| XF8M000000S410 | 8.000000 | ±10 | 10 | ±30 | -40 ~ +85 | 350 |
| XF8M000000S412 | 8.000000 | ±10 | 12 | ±30 | -40 ~ +85 | 350 |
| XF8M000000S4118 | 8.000000 | ±10 | 18 | ±50 | -40 ~ +125 | 300 |
| XF11M05920S420 | 11.05920 | ±10 | 20 | ±30 | -40 ~ +85 | 100 |
| XF12M000000S110 | 12.00000 | ±20 | 8 | ±30 | -40 ~ +85 | 100 |
| XF12M00000S4310 | 12.00000 | ±30 | 10 | ±30 | -40 ~ +85 | 80 |
| XF12M00000S410 | 12.00000 | ±10 | 10 | ±30 | -40 ~ +85 | 100 |
| XF12M00000S412 | 12.00000 | ±10 | 12 | ±30 | -40 ~ +85 | 100 |
| XF12M00000S101 | 12.00000 | ±30 | 18 | ±30 | -20 ~ +70 | 100 |
| XF12M00000S420 | 12.00000 | ±10 | 20 | ±30 | -40 ~ +85 | 100 |
| XF12M28800S412 | 12.28800 | ±10 | 12 | ±30 | -40 ~ +85 | 100 |
| XF12M28800S415 | 12.28800 | ±20 | 15 | ±30 | -40 ~ +85 | 80 |
| XF13M52127S420 | 13.52127 | ±10 | 20 | ±30 | -40 ~ +85 | 100 |
| XF13M56000S420 | 13.56000 | ±10 | 20 | ±30 | -40 ~ +85 | 100 |
| XF13M82400S412 | 13.82400 | ±10 | 12 | ±30 | -40 ~ +85 | 100 |
| XF14M31818S412 | 14.31818 | ±10 | 12 | ±30 | -40 ~ +85 | 100 |
| XF14M31818S420 | 14.31818 | ±10 | 20 | ±30 | -40 ~ +85 | 100 |
| XF14M74560S420 | 14.74560 | ±10 | 20 | ±30 | -40 ~ +85 | 100 |
| XF16M00000S110 | 16.00000 | ±20 | 8 | ±30 | -40 ~ +85 | 80 |
| XF16M00000S409 | 16.00000 | ±10 | 9 | ±30 | -40 ~ +85 | 100 |

ELECTRICAL PARAMETERS – FOR DIFFERENT PART CODE- Ta = 25°C

| PART CODE | FREQUENCY RANGE | FREQUENCY TOLERANCE | LOAD CAPACITANCE | FREQUENCY STABILITY | OPERATING TEMPE. RANGE | EQUIVALENT SERIES RESISTANCE |
|-----------------|-----------------|---------------------|------------------|---------------------|------------------------|------------------------------|
| | MHz | ppm | pF | ppm | °C | Ω Max. |
| XF16M00000S410 | 16.00000 | ±10 | 10 | ±30 | -40 ~ +85 | 80 |
| XF16M00000S412 | 16.00000 | ±10 | 12 | ±30 | -40 ~ +85 | 100 |
| XF16M00000S418 | 16.00000 | ±50 | 18 | ±30 | -40 ~ +85 | 80 |
| XF18M00000S412 | 18.00000 | ±10 | 12 | ±30 | -40 ~ +85 | 80 |
| XF18M43200S420 | 18.43200 | ±20 | 20 | ±30 | -40 ~ +85 | 80 |
| XF19M20000S407 | 19.20000 | ±10 | 7 | ±30 | -40 ~ +85 | 60 |
| XF20M00000S408 | 20.00000 | ±10 | 8 | ±30 | -40 ~ +85 | 60 |
| XF20M00000S409 | 20.00000 | ±10 | 9 | ±30 | -40 ~ +85 | 60 |
| XF20M00000S415 | 20.00000 | ±10 | 15 | ±30 | -40 ~ +85 | 60 |
| XF20M00000S416 | 20.00000 | ±10 | 16 | ±30 | -40 ~ +85 | 60 |
| XF20M00000S418 | 20.00000 | ±10 | 18 | ±30 | -40 ~ +85 | 60 |
| XF20M00000S420 | 20.00000 | ±10 | 20 | ±30 | -40 ~ +85 | 60 |
| XF22M11840S420 | 22.11840 | ±10 | 20 | ±30 | -40 ~ +85 | 60 |
| XF24M00000S409 | 24.00000 | ±10 | 9 | ±30 | -40 ~ +85 | 60 |
| XF24M00000S410 | 24.00000 | ±10 | 10 | ±30 | -40 ~ +85 | 60 |
| XF24M00000S412 | 24.00000 | ±10 | 12 | ±30 | -40 ~ +85 | 60 |
| XF24M00000S4112 | 24.00000 | ±20 | 12 | ±50 | -40 ~ +125 | 50 |
| XF24M00000S415 | 24.00000 | ±10 | 15 | ±30 | -40 ~ +85 | 60 |
| XF24M00000S416 | 24.00000 | ±10 | 16 | ±30 | -40 ~ +85 | 60 |
| XF24M000S12418 | 24.00000 | ±10 | 18 | ±20 | -40 ~ +85 | 60 |

ELECTRICAL PARAMETERS – FOR DIFFERENT PART CODE- Ta = 25°C

| PART CODE | FREQUENCY RANGE | FREQUENCY TOLERANCE | LOAD CAPACITANCE | FREQUENCY STABILITY | OPERATING TEMPE. RANGE | EQUIVALENT SERIES RESISTANCE |
|----------------|-----------------|---------------------|------------------|---------------------|------------------------|------------------------------|
| | MHz | ppm | pF | ppm | °C | Ω Max. |
| XF24M000S13418 | 24.00000 | ±10 | 18 | ±30 | -40 ~ +85 | 60 |
| XF24M00000S418 | 24.00000 | ±30 | 18 | ±50 | -40 ~ +85 | 60 |
| XF24M00000S101 | 24.00000 | ±10 | 18 | ±10 | -20 ~ +75 | 40 |
| XF24M00000S002 | 24.00000 | ±50 | 20 | ±50 | -20 ~ +70 | 50 |
| XF24M00000S420 | 24.00000 | ±10 | 20 | ±30 | -40 ~ +85 | 60 |
| XF24M54545S001 | 24.54545 | ±30 | 12 | ±50 | -40 ~ +85 | 80 |
| XF24M57600S412 | 24.57600 | ±10 | 12 | ±30 | -40 ~ +85 | 60 |
| XF24M57600S420 | 24.57600 | ±10 | 20 | ±30 | -40 ~ +85 | 60 |
| XF25M00000S408 | 25.00000 | ±10 | 8 | ±30 | -40 ~ +85 | 60 |
| XF25M00000S410 | 25.00000 | ±10 | 10 | ±30 | -40 ~ +85 | 60 |
| XF25M00000S412 | 25.00000 | ±10 | 12 | ±30 | -40 ~ +85 | 60 |
| XF25M00000S416 | 25.00000 | ±10 | 16 | ±30 | -40 ~ +85 | 60 |
| XF25M00000S418 | 25.00000 | ±10 | 18 | ±30 | -40 ~ +85 | 60 |
| XF25M00000S420 | 25.00000 | ±10 | 20 | ±30 | -40 ~ +85 | 60 |
| XF25M00000S001 | 25.00000 | ±50 | 20 | ±50 | -40 ~ +85 | 40 |
| XF26M00000S409 | 26.00000 | ±10 | 9 | ±30 | -40 ~ +85 | 60 |
| XF26M00000S412 | 26.00000 | ±10 | 12 | ±30 | -40 ~ +85 | 60 |
| XF26M00000S415 | 26.00000 | ±10 | 15 | ±30 | -40 ~ +85 | 60 |
| XF26M00000S420 | 26.00000 | ±10 | 20 | ±30 | -40 ~ +85 | 60 |
| XF27M00000S410 | 27.00000 | ±10 | 10 | ±30 | -40 ~ +85 | 60 |

ELECTRICAL PARAMETERS – FOR DIFFERENT PART CODE- Ta = 25°C

| PART CODE | FREQUENCY RANGE | FREQUENCY TOLERANCE | LOAD CAPACITANCE | FREQUENCY STABILITY | OPERATING TEMPE. RANGE | EQUIVALENT SERIES RESISTANCE |
|----------------|-----------------|---------------------|------------------|---------------------|------------------------|------------------------------|
| | MHz | ppm | pF | ppm | °C | Ω Max. |
| XF27M00000S412 | 27.00000 | ±10 | 12 | ±30 | -40 ~ +85 | 60 |
| XF27M00000S415 | 27.00000 | ±10 | 15 | ±30 | -40 ~ +85 | 60 |
| XF27M00000S418 | 27.00000 | ±10 | 18 | ±30 | -40 ~ +85 | 60 |
| XF27M00000S420 | 27.00000 | ±10 | 20 | ±30 | -40 ~ +85 | 60 |
| XF27M12000S410 | 27.12000 | ±10 | 10 | ±30 | -40 ~ +85 | 60 |
| XF27M12000S412 | 27.12000 | ±10 | 12 | ±30 | -40 ~ +85 | 60 |
| XF27M12000S420 | 27.12000 | ±10 | 20 | ±30 | -40 ~ +85 | 60 |
| XF28M00000S410 | 28.00000 | ±10 | 10 | ±30 | -40 ~ +85 | 60 |
| XF28M63636S420 | 28.63636 | ±10 | 20 | ±30 | -40 ~ +85 | 60 |
| XF30M00000S420 | 30.00000 | ±10 | 20 | ±30 | -40 ~ +85 | 60 |
| XF32M00000S409 | 32.00000 | ±10 | 9 | ±30 | -40 ~ +85 | 40 |
| XF32M00000S410 | 32.00000 | ±10 | 10 | ±30 | -40 ~ +85 | 40 |
| XF32M00000S411 | 32.00000 | ±10 | 11 | ±30 | -40 ~ +85 | 40 |
| XF37M40000S409 | 37.40000 | ±10 | 9 | ±30 | -40 ~ +85 | 60 |
| XF37M40000S412 | 37.40000 | ±10 | 12 | ±30 | -40 ~ +85 | 40 |
| XF37M40000S416 | 37.40000 | ±10 | 16 | ±30 | -40 ~ +85 | 40 |
| XF40M00000S408 | 40.00000 | ±10 | 8 | ±30 | -40 ~ +85 | 40 |
| XF40M00000S409 | 40.00000 | ±10 | 9 | ±30 | -40 ~ +85 | 40 |
| XF40M00000S410 | 40.00000 | ±10 | 10 | ±30 | -40 ~ +85 | 40 |
| XF40M00000S412 | 40.00000 | ±10 | 12 | ±30 | -40 ~ +85 | 40 |

ELECTRICAL PARAMETERS – FOR DIFFERENT PART CODE- Ta = 25°C

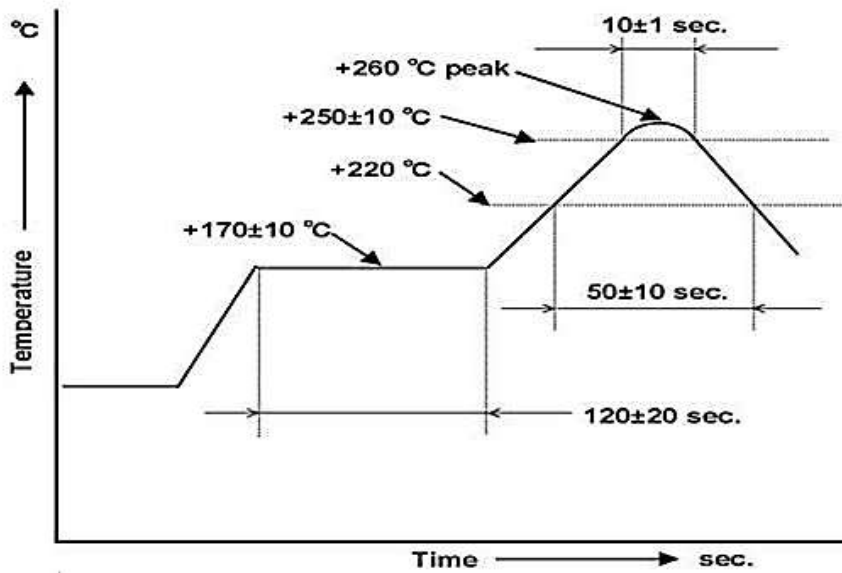
| PART CODE | FREQUENCY RANGE | FREQUENCY TOLERANCE | LOAD CAPACITANCE | FREQUENCY STABILITY | OPERATING TEMPE. RANGE | EQUIVALENT SERIES RESISTANCE |
|----------------|-----------------|---------------------|------------------|---------------------|------------------------|------------------------------|
| | MHz | ppm | pF | ppm | °C | Ω Max. |
| XF40M00000S415 | 40.00000 | ±10 | 15 | ±30 | -40 ~ +85 | 40 |
| XF40M00000S420 | 40.00000 | ±10 | 20 | ±30 | -40 ~ +85 | 40 |
| XF48M00000S409 | 48.00000 | ±10 | 9 | ±30 | -40 ~ +85 | 40 |
| XF48M00000S420 | 48.00000 | ±10 | 20 | ±30 | -40 ~ +85 | 40 |
| XF50M00000S409 | 50.00000 | ±10 | 9 | ±30 | -40 ~ +85 | 40 |
| XF50M00000S420 | 50.00000 | ±10 | 20 | ±30 | -40 ~ +85 | 40 |
| XF50M00000S410 | 50.00000 | ±10 | 10 | ±30 | -40 ~ +85 | 40 |
| XF52M00000S420 | 52.00000 | ±10 | 20 | ±30 | -40 ~ +85 | 60 |
| XF54M00000S415 | 54.00000 | ±10 | 15 | ±30 | -40 ~ +85 | 40 |
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RELIABILITY - MECHANICAL AND ENVIRONMENTAL ENDURANCE

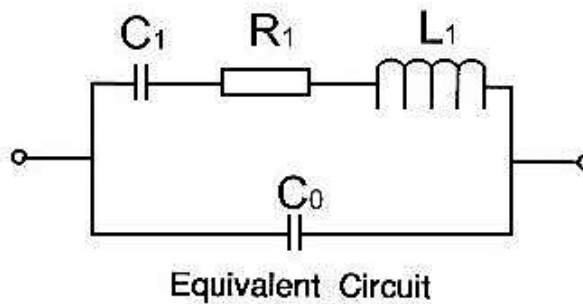
| TEST ITEMS | TEST METHOD AND CONDITIONS | REQUIREMENTS |
|---------------------|---|---|
| Drop | Free drop from 75cm height on a hard wooden board for 3 times. (Board is thickness more than 30mm.) | Frequency change: ≤5ppm Rr as specification |
| Shake | Shake frequency 10~55Hz, cyc1~2 minutes, swing 1.5mm, direction x/y/z, all 30 minutes, test after 1 hours. | Frequency change: ≤5ppm Rr as specification |
| Airproof | Put crystal into the pressure cabin with alcohol, keep pressure 0.4~0.5mpa 10 minutes, then take out and blow for 5 minutes | IR≥500MΩ |
| Weld | Temperature: 260±5°C Time: 3 seconds | 90% exhibit tin ok |
| Humidity | Temperature: +40±2°C Humidity: 90%~95% R.H. Time: 250 hours | Frequency change: ≤5ppm Rr as specification |
| Low temperature | Temperature: -30±2°C Time: 250 hours put in room temperature, test after 1 hours. | Frequency change: ≤5ppm Rr as specification |
| High Temperature | Temperature: +85±2°C Time: 250 hours put in room temperature, test after 1 hours. | Frequency change: ≤5ppm Rr as specification |
| Temperature cycling | -30±3°C/30±3 min~+85±2°C/30±3min, 5 cycles | Frequency change: ≤5ppm Rr as specification |

SUGGESTED REFLOW PROFILE - FOR REFERENCE ONLY

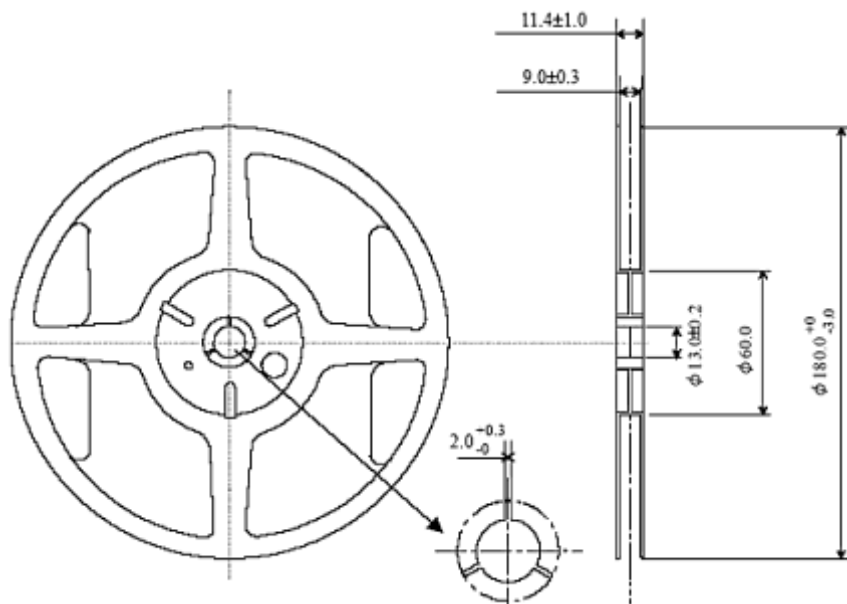
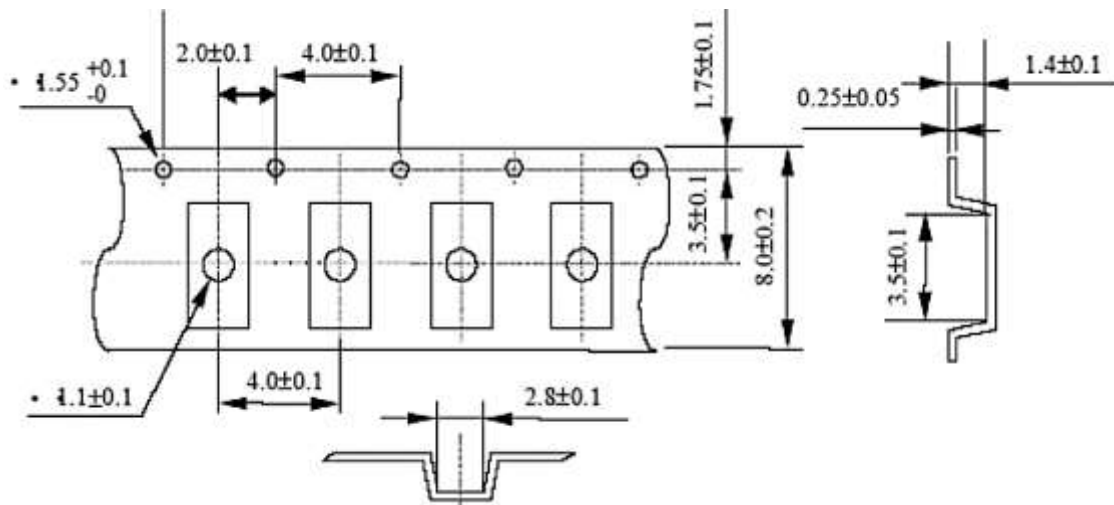
Condition:



EQUIVALENT CIRCUIT



TAPE AND REEL - Unit: mm, 3000pcs/Reel



IMPORTANT NOTES AND DISCLAIMER

1. **ROHS COMPLIANCE:** The levels of RoHS restricted materials in this product are below the maximum concentration values (also referred to as the threshold limits) permitted for such substances, or are used in an exempted application, in accordance with EU RoHS Directive (EU) 2015/863 EC (RoHS3). RoHS Test Report for this product can be obtained at Download Center.
2. **REACH COMPLIANCE:** REACH substances of high concern (SVHCs) information is available for this product. Since the European Chemical Agency (ECHA) has published notice of their intent to frequently revise the SVHC listing for the foreseeable future, REACH Test Report for this product can be obtained at Download Center.
3. All Product parametric performance is indicated in the Electrical Characteristics for the listed herein test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.
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7. *NextGen* products are not authorized for use as critical components in life support devices or systems without express written approval by *NextGen*.
8. *NextGen* requires that customers first obtain an RMA (Returned Merchandise Authorization) number prior to returning any products. Returns must be made within 30 days of the date of invoice, be in the original packaging, unused and like-new condition. At the time of quoting or purchasing, a product may say that it is Non-Cancelable/ Non-Returnable (NCNR). These products are not returnable and not refundable.