

# CONTINUOUS VOLTAGE SMD TCXO

ATX-11

Request Samples



Check Inventory



ESD Sensitive



3.2 x 2.5 x 1.2 mm  
RoHS/RoHS II Compliant  
MSL Level = 1

## Features

- Both continuous & fixed Vdd options available
- Output waveform clipped sinewave
- Hermetically seam-sealed ceramic package
- Low current consumption

## Applications

- Cellular and cordless phones
- Standard oscillator for exact equipment
- Consumer electronics
- Industrial control & automation
- Mobile communication

## Electrical Specifications [Note 1]

| Parameters                                               | Min.                                                                                        | Typ. | Max.   | Units  | Notes                                                                                       |
|----------------------------------------------------------|---------------------------------------------------------------------------------------------|------|--------|--------|---------------------------------------------------------------------------------------------|
| Frequency Range                                          | 10                                                                                          |      | 52     | MHz    |                                                                                             |
| Standard Frequencies                                     | 10, 13.1072, 14.848, 15.6256, 16, 16.8, 18.432, 25, 25.78718, 26.27, 29.756, 32, 40, 44, 50 |      |        | MHz    |                                                                                             |
| Operating Temperature                                    | -40                                                                                         |      | +85    | °C     | See Options (Table 1)                                                                       |
| Storage Temperature                                      | -40                                                                                         |      | +85    | °C     |                                                                                             |
| <b>Frequency Stability <math>\Delta f/f_0</math> vs:</b> |                                                                                             |      |        |        |                                                                                             |
| <i>Tolerance</i>                                         | -1.0                                                                                        |      | +1.0   | ppm    | Reference to $f_0$ , at 25°C±2°C, Pre-reflow                                                |
| <i>Tolerance</i>                                         | -2.0                                                                                        |      | +2.0   |        | Reference to $f_0$ , at 25°C ±2°C, 24 hours after reflow, two times                         |
| <i>Temperature</i>                                       | -2.5                                                                                        |      | +2.5   |        | See Options (Table 1)                                                                       |
| <i>Supply Voltage Change</i>                             | -0.2                                                                                        |      | +0.2   |        | Reference to $f_0$ , at 25°C ±2°C                                                           |
| <i>Load Change</i>                                       | -0.2                                                                                        |      | +0.2   |        | Vdd ± 5%                                                                                    |
| Aging                                                    | -1.0                                                                                        |      | +1.0   |        | CL ± 1kΩ/±1pF                                                                               |
| Supply Voltage (Vdd)                                     | +3.135                                                                                      | +3.3 | +3.465 | V      | First year @+25°C±2°C                                                                       |
|                                                          | +2.85                                                                                       | +3.0 | +3.15  |        | Option E                                                                                    |
|                                                          | +2.66                                                                                       | +2.8 | +2.94  |        | Option A                                                                                    |
|                                                          | +2.375                                                                                      | +2.5 | +2.625 |        | Option B                                                                                    |
|                                                          | +1.71                                                                                       | +1.8 | +1.89  |        | Option C                                                                                    |
|                                                          | +1.68                                                                                       |      | +3.63  |        | Option D                                                                                    |
| Supply Current (Idd)                                     |                                                                                             |      | 2.0    | mA     | Option F                                                                                    |
|                                                          |                                                                                             |      | 2.5    |        | 10.00MHz to 26.00 MHz                                                                       |
| Start-up Time                                            |                                                                                             |      | 2.0    | ms     | 26.01MHz to 52.00MHz                                                                        |
| Output Voltage                                           | 0.8                                                                                         |      |        | Vp-p   |                                                                                             |
| Output Load                                              | 9                                                                                           | 10   | 11     | kΩ     |                                                                                             |
|                                                          | 9                                                                                           | 10   | 11     | pF     |                                                                                             |
| Output Waveform                                          | Clipped Sine Wave, External DC-Cut Capacitor Required                                       |      |        |        | 1000 pF recommended                                                                         |
| <b>Phase Noise (@ 10 MHz Carrier, @ 25°C ±2°C)</b>       |                                                                                             |      |        |        |                                                                                             |
| @10Hz offset                                             |                                                                                             | -100 | -96    | dBc/Hz | Applicable to all standard available frequencies with Vdd = +1.8V, +2.5, +2.8, +3.0V, +3.3V |
| @100Hz offset                                            |                                                                                             | -125 | -121   |        |                                                                                             |
| @1kHz offset                                             |                                                                                             | -138 | -134   |        |                                                                                             |
| @10kHz offset                                            |                                                                                             | -149 | -146   |        |                                                                                             |
| @100kHz offset                                           |                                                                                             | -158 | -155   |        |                                                                                             |
| @1MHz offset                                             |                                                                                             | -159 | -156   |        |                                                                                             |
| @5MHz offset                                             |                                                                                             | -159 | -156   |        |                                                                                             |
| <b>Phase Noise (@ 52 MHz Carrier, @ 25°C ±2°C)</b>       |                                                                                             |      |        |        |                                                                                             |
| @10Hz offset                                             |                                                                                             | -83  | -79    | dBc/Hz | Applicable to all standard available frequencies with Vdd = +1.8V, +2.5, +2.8, +3.0V, +3.3V |
| @100Hz offset                                            |                                                                                             | -110 | -106   |        |                                                                                             |
| @1kHz offset                                             |                                                                                             | -132 | -128   |        |                                                                                             |
| @10kHz offset                                            |                                                                                             | -149 | -146   |        |                                                                                             |
| @100kHz offset                                           |                                                                                             | -156 | -153   |        |                                                                                             |
| @1MHz offset                                             |                                                                                             | -157 | -154   |        |                                                                                             |
| @10MHz offset                                            |                                                                                             | -157 | -154   |        |                                                                                             |
| @20MHz offset                                            |                                                                                             | -158 | -155   |        |                                                                                             |

Note 1: All measurements made at 25°C ±2°C, nominal Vdd, unless otherwise specified



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## Part Identification

ATX-11-- MHz--

| Vdd (V)            |
|--------------------|
| A: 3.0V±5%         |
| B: 2.8V±5%         |
| C: 2.5V±5%         |
| D: 1.8V±5%         |
| E: 3.3V±5%         |
| F: +1.68V ~ +3.63V |

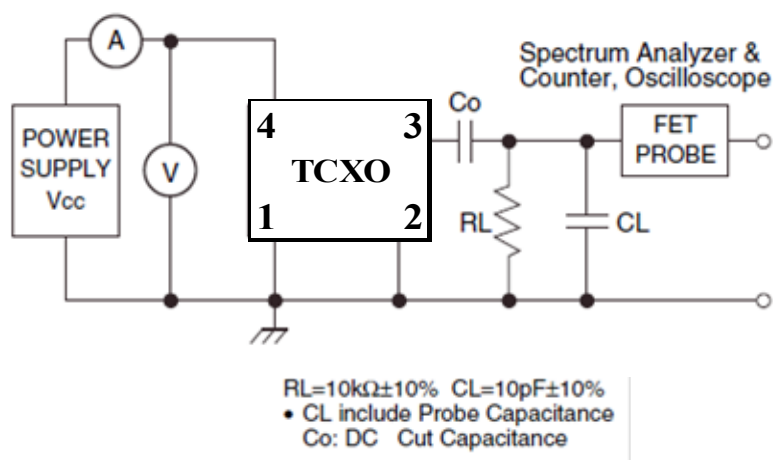
| Frequency in MHz                                       |
|--------------------------------------------------------|
| Please specify the frequency in MHz.<br>e.g. 26.000MHz |

| Packaging        |
|------------------|
| Blank: Bulk      |
| T: 1000pcs/reel  |
| T3: 3000pcs/reel |

Table 1: Frequency Stability vs Operating Temperature

|               | ±0.5ppm | ±1.0ppm | ±1.5ppm | ±2.0ppm | ±2.5ppm |
|---------------|---------|---------|---------|---------|---------|
| 0°C ~ +70°C   | A05     | A10     | A15     | A20     | A25     |
| -10°C ~ +60°C | B05     | B10     | B15     | B20     | B25     |
| -20°C ~ +70°C | C05     | C10     | C15     | C20     | C25     |
| -30°C ~ +75°C | D05     | D10     | D15     | D20     | D25     |
| -30°C ~ +85°C | E05     | E10     | E15     | E20     | E25     |
| -40°C ~ +85°C | F05     | F10     | F15     | F20     | F25     |

## Recommended Test Circuit



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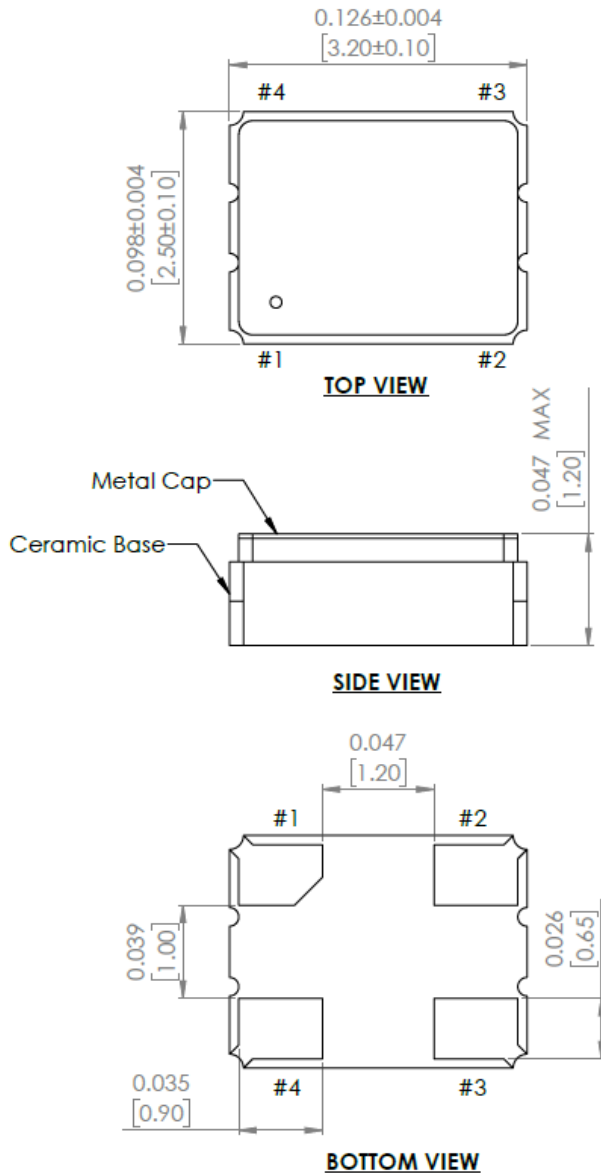


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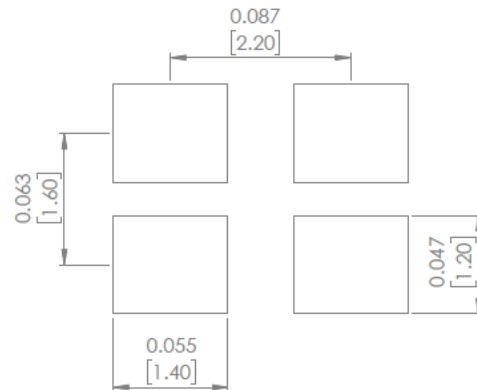


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## Mechanical Dimensions



## Recommended Land Pattern



| Pin # | Function |
|-------|----------|
| 1     | GND      |
| 2     | GND      |
| 3     | Output   |
| 4     | Vdd      |

Dimensions: inches (mm)

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## Reflow Profile [JDEC J-STD-020]

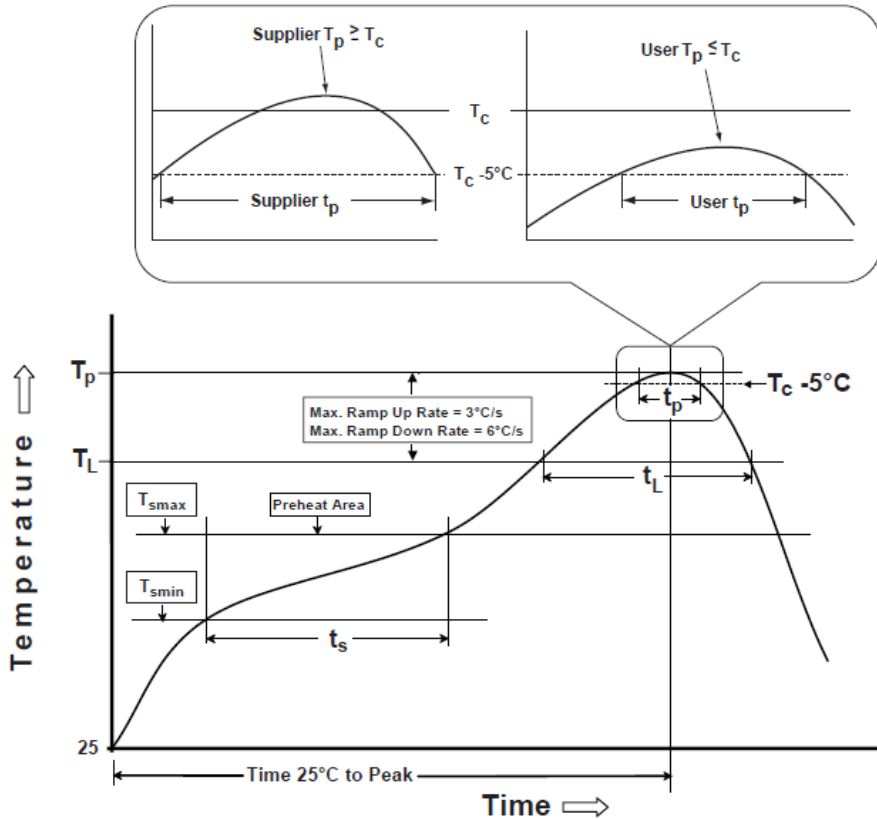


Table 1

| SnPb Eutectic Process<br>Classification Temperatures ( $T_c$ ) |                             |                             |
|----------------------------------------------------------------|-----------------------------|-----------------------------|
| Package Thickness                                              | Volume mm <sup>3</sup> <350 | Volume mm <sup>3</sup> ≥350 |
| <2.5 mm                                                        | 235 °C                      | 220 °C                      |
| ≥2.5 mm                                                        | 220 °C                      | 220 °C                      |

Table 2

| Pb-Free Process<br>Classification Temperatures ( $T_c$ ) |                             |                                 |                              |
|----------------------------------------------------------|-----------------------------|---------------------------------|------------------------------|
| Package Thickness                                        | Volume mm <sup>3</sup> <350 | Volume mm <sup>3</sup> 350-2000 | Volume mm <sup>3</sup> >2000 |
| <1.6 mm                                                  | 260 °C                      | 260 °C                          | 260 °C                       |
| 1.6 mm - 2.5 mm                                          | 260 °C                      | 250 °C                          | 245 °C                       |
| >2.5 mm                                                  | 250 °C                      | 245 °C                          | 245 °C                       |

| Profile Feature                                                                   | Sn-Pb Eutectic Assembly | Pb-Free Assembly |
|-----------------------------------------------------------------------------------|-------------------------|------------------|
| Preheat / soak                                                                    |                         |                  |
| Temperature minimum ( $T_{smin}$ )                                                | 100°C                   | 150°C            |
| Temperature maximum ( $T_{smax}$ )                                                | 150°C                   | 200°C            |
| Time ( $T_{smin}$ to $T_{smax}$ ) ( $t_s$ )                                       | 60 - 120 sec.           | 60 - 120 sec.    |
| Average ramp-up rate ( $T_{smax}$ to $T_p$ )                                      | 3°C/sec. max            | 3°C/sec. max     |
| Liquidous temperature ( $T_L$ )                                                   | 183°C                   | 217°C            |
| Time at liquidous ( $t_L$ )                                                       | 60 - 150 sec.           | 60 - 150 sec.    |
| Peak package body temperature ( $T_p$ )*                                          | see Table 1             | see Table 2      |
| Time ( $t_p$ )** within 5°C of the specified classification temperature ( $T_c$ ) | 20 sec.                 | 30 sec.          |
| Ramp-down rate ( $T_p$ to $T_{smax}$ )                                            | 6°C/sec. max            | 6°C/sec. max     |
| Time 25°C to peak temperature                                                     | 6 min. max              | 8 min. max       |

\*Tolerance for peak profile temperature ( $T_p$ ) is defined as a supplier minimum and a user maximum.

\*\*Tolerance for time at peak profile temperature ( $t_p$ ) is defined as supplier minimum and a user maximum.

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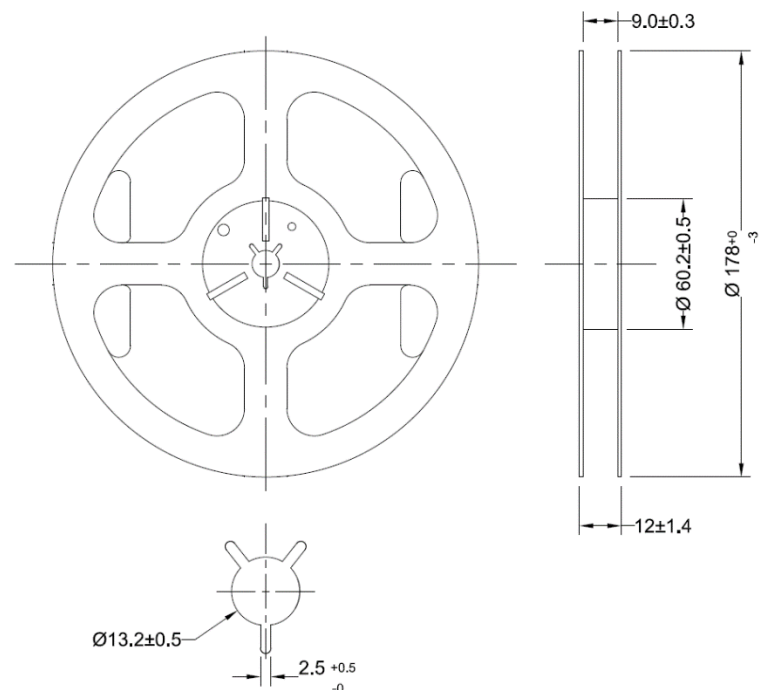
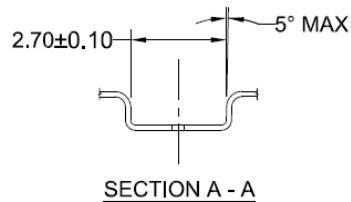
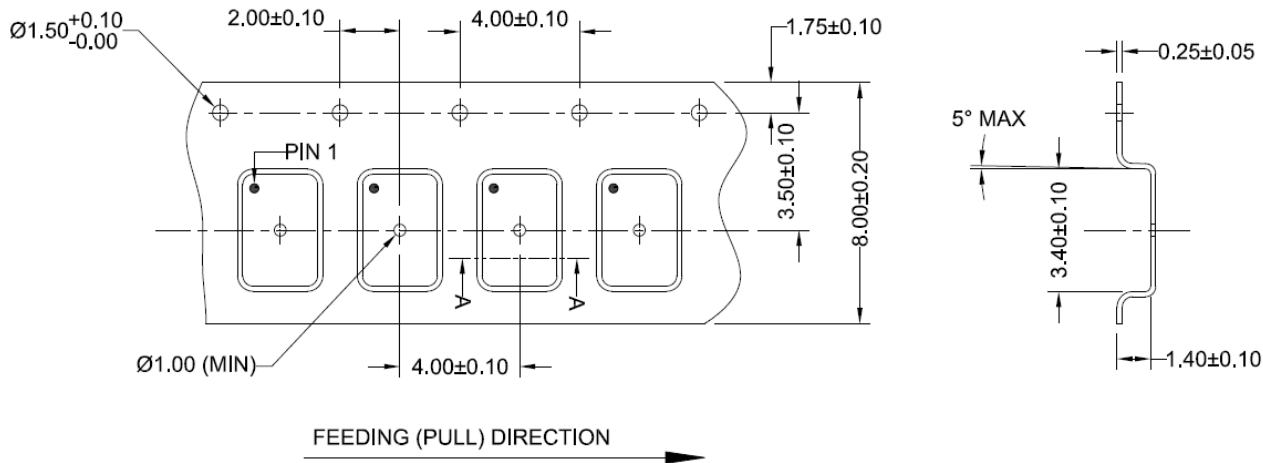


3.2 x 2.5 x 1.2 mm  
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MSL Level = 1

## Packaging

T: 1,000pcs/reel

T3: 3,000pcs/reel



Dimensions: mm

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