

# ULTRA MINIATURE SMD VC/TCXO

ASVTX-13/ASTX-13

Moisture Sensitivity Level (MSL) –1



**RoHS**  
Compliant



2.0 x 1.6 x 0.8mm

## FEATURES:

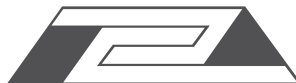
- Industry smallest 2.0 x 1.6 x 0.8mm
- Low current consumption 1.5mA at 26MHz
- Vc function ideal for PLL application
- Suitable for RoHS complaint reflow

## APPLICATIONS:

- Cellular and cordless phones
- Standard reference oscillator for test equipment
- Mobile communication equipment
- Portable radio equipment and music player
- Phase Locked Loop

## STANDARD SPECIFICATIONS:

| Parameters                                                                                                                                  |          | Minimum                        | Typical | Maximum | Units | Notes                                 |
|---------------------------------------------------------------------------------------------------------------------------------------------|----------|--------------------------------|---------|---------|-------|---------------------------------------|
| Frequency Range                                                                                                                             |          | 13                             | -----   | 52      | MHz   |                                       |
| Standard Frequencies                                                                                                                        |          | 13, 16.368, 19.2, 26, 38.4, 52 |         |         | MHz   | 16.368MHz is available only as a TCXO |
| Operating Temperature                                                                                                                       |          | -30                            | -----   | +75     | °C    |                                       |
| Storage Temperature                                                                                                                         |          | -40                            | -----   | +85     | °C    |                                       |
| Frequency Stability Δf/f0 vs<br>Tolerance (@+25°C)<br>Temperature (ref. to +25°C)<br>Supply Voltage Change (Vdd±5%)<br>Load Change (ZL±10%) |          | -2.0                           | -----   | +2.0    | ppm   | +25°C, Vcon=1.4V<br>After 2- reflow   |
|                                                                                                                                             |          | -1.5                           | -----   | +1.5    |       | See option (Table 1)                  |
|                                                                                                                                             |          | -0.2                           | -----   | +0.2    |       |                                       |
|                                                                                                                                             |          | -0.2                           | -----   | +0.2    |       |                                       |
| Supply Voltage (Vdd)                                                                                                                        |          | +2.85                          | +3.0    | +3.15   | V     | Option A                              |
|                                                                                                                                             |          | +2.66                          | +2.8    | +2.94   |       | Option B                              |
|                                                                                                                                             |          | +1.71                          | +1.8    | +1.89   |       | Option C (ASTX only)                  |
| Aging (first year @+25±2°C)                                                                                                                 |          | -1.0                           | -----   | +1.0    | ppm   |                                       |
| Supply Current (Icc)                                                                                                                        | Vdd=3.0V | -----                          | -----   | 1.5     | mA    | 16.368MHz, -30 to +85°C               |
|                                                                                                                                             |          | -----                          | -----   | 1.5     |       | 19.200MHz, -30 to +85°C               |
|                                                                                                                                             |          | -----                          | -----   | 1.5     |       | 26.000MHz, -30 to +85°C               |
|                                                                                                                                             |          | -----                          | -----   | 2.0     |       | 38.400MHz, -30 to +85°C               |
|                                                                                                                                             | Vdd=2.8V | -----                          | -----   | 1.5     | mA    | 16.368MHz, -30 to +85°C               |
|                                                                                                                                             |          | -----                          | -----   | 1.5     |       | 19.200MHz, -30 to +85°C               |
|                                                                                                                                             |          | -----                          | -----   | 1.5     |       | 26.000MHz, -30 to +85°C               |
|                                                                                                                                             |          | -----                          | -----   | 1.5     |       | 38.400MHz, -30 to +85°C               |
|                                                                                                                                             | Vdd=1.8V | -----                          | -----   | 1.5     | mA    | 16.368MHz, -30 to +85°C               |
|                                                                                                                                             |          | -----                          | -----   | 1.5     |       | 19.200MHz, -30 to +85°C               |
|                                                                                                                                             |          | -----                          | -----   | 1.5     |       | 26.000MHz, -30 to +85°C               |
|                                                                                                                                             |          | -----                          | -----   | 1.5     |       | 38.400MHz, -30 to +85°C               |
| Startup Time                                                                                                                                |          | -----                          | -----   | 3.0     | ms    | 90% Vp-p ±0.5ppm                      |





| Parameters                                                           |          | Minimum           | Typical | Maximum | Units  | Notes                                                                                       |
|----------------------------------------------------------------------|----------|-------------------|---------|---------|--------|---------------------------------------------------------------------------------------------|
| Voltage Control Function<br>(for ASVTX-13)<br>Control Voltage (Vcon) | Vdd=3.0V | +0.4              | +1.4    | +2.4    | Vdc    | 19.2MHz<br>26.0MHz<br>38.4MHz                                                               |
|                                                                      | Vdd=2.8V | +0.4              | +1.4    | +2.4    |        | 19.2MHz                                                                                     |
|                                                                      |          | +0.5              | +1.5    | +2.5    |        | 26.0MHz                                                                                     |
|                                                                      |          | +0.1              | +1.2    | +2.3    |        | 38.4MHz                                                                                     |
| Frequency Tuning Range                                               |          |                   |         |         | ppm    |                                                                                             |
| @Vcon (min)                                                          |          | -5.5              |         | -9.5    |        |                                                                                             |
| @Vcon (max)                                                          |          | +5.5              |         | +9.5    |        |                                                                                             |
| Frequency Tuning Transition                                          |          | Positive          |         |         |        |                                                                                             |
| Output Voltage                                                       |          | 0.8               | -----   | -----   | Vp-p   |                                                                                             |
| Harmonics                                                            |          | -----             | -----   | -5.0    | dBc    |                                                                                             |
| Load                                                                 |          | 10kΩ//10pF        |         |         |        |                                                                                             |
| Waveform                                                             |          | Clipped Sine Wave |         |         |        |                                                                                             |
| Phase Noise                                                          |          |                   |         |         |        |                                                                                             |
| 10Hz offset from the carrier                                         |          | -----             | -----   | -80     | dBc/Hz | Applicable to all<br>standard available<br>frequencies with<br>Vdd = +1.8V, +2.8<br>& +3.3V |
| 100Hz offset from the carrier                                        |          | -----             | -----   | -105    |        |                                                                                             |
| 1kHz offset from the carrier                                         |          | -----             | -----   | -130    |        |                                                                                             |
| 10kHz offset from the carrier                                        |          | -----             | -----   | -144    |        |                                                                                             |
| 100kHz offset from the carrier                                       |          | -----             | -----   | -144    |        |                                                                                             |

## ➤ OPTIONS &amp; PART IDENTIFICATION:

ASVTX-13 or ASTX-13 -  -  MHz -  - 

| Vdd (V)      |
|--------------|
| A*: 3.0V±5%  |
| B*: 2.8V±5%  |
| C**: 1.8V±5% |

\*16.368MHz is only for ASTX-13 (TCXO)

\*\*1.8V is only for ASTX-13 (TCXO)

| Frequency in MHz                                                    |
|---------------------------------------------------------------------|
| Please specify the frequency in MHz.<br>e.g. 19.200MHz<br>26.000MHz |

| Packaging              |
|------------------------|
| Blank: Bulk            |
| T: 1000pcs/reel        |
| T3: 3000pcs/reel       |
| T4: 4000pcs/reel (STD) |

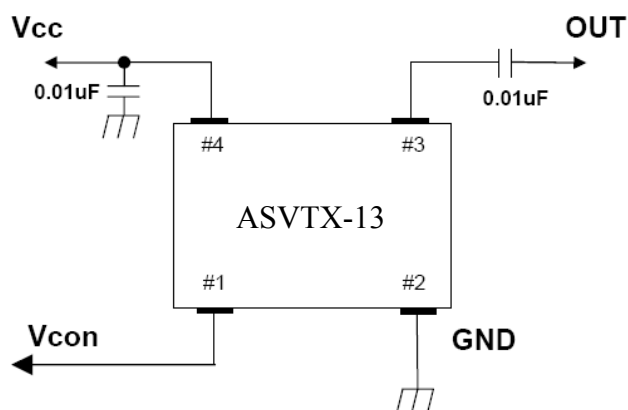
Table 1: Frequency Stability vs Operating Temperature

|               | ±0.5ppm | ±1.0ppm | ±1.5ppm     | ±2.0ppm |
|---------------|---------|---------|-------------|---------|
| -10°C ~ +75°C | A05     | A10     | A15         | A20     |
| -30°C ~ +75°C | B05     | B10     | Std.(Blank) | B20     |
| -30°C ~ +80°C | C05     | C10     | C15         | C20     |
| -30°C ~ +85°C | D05     | D10     | D15         | D20     |

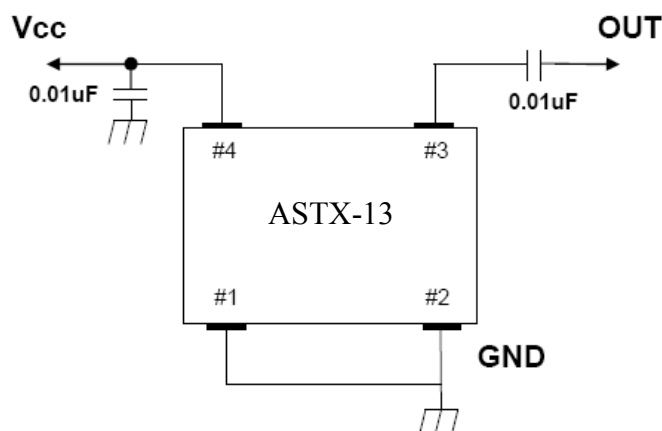




### RECOMMENDED TEST CIRCUIT

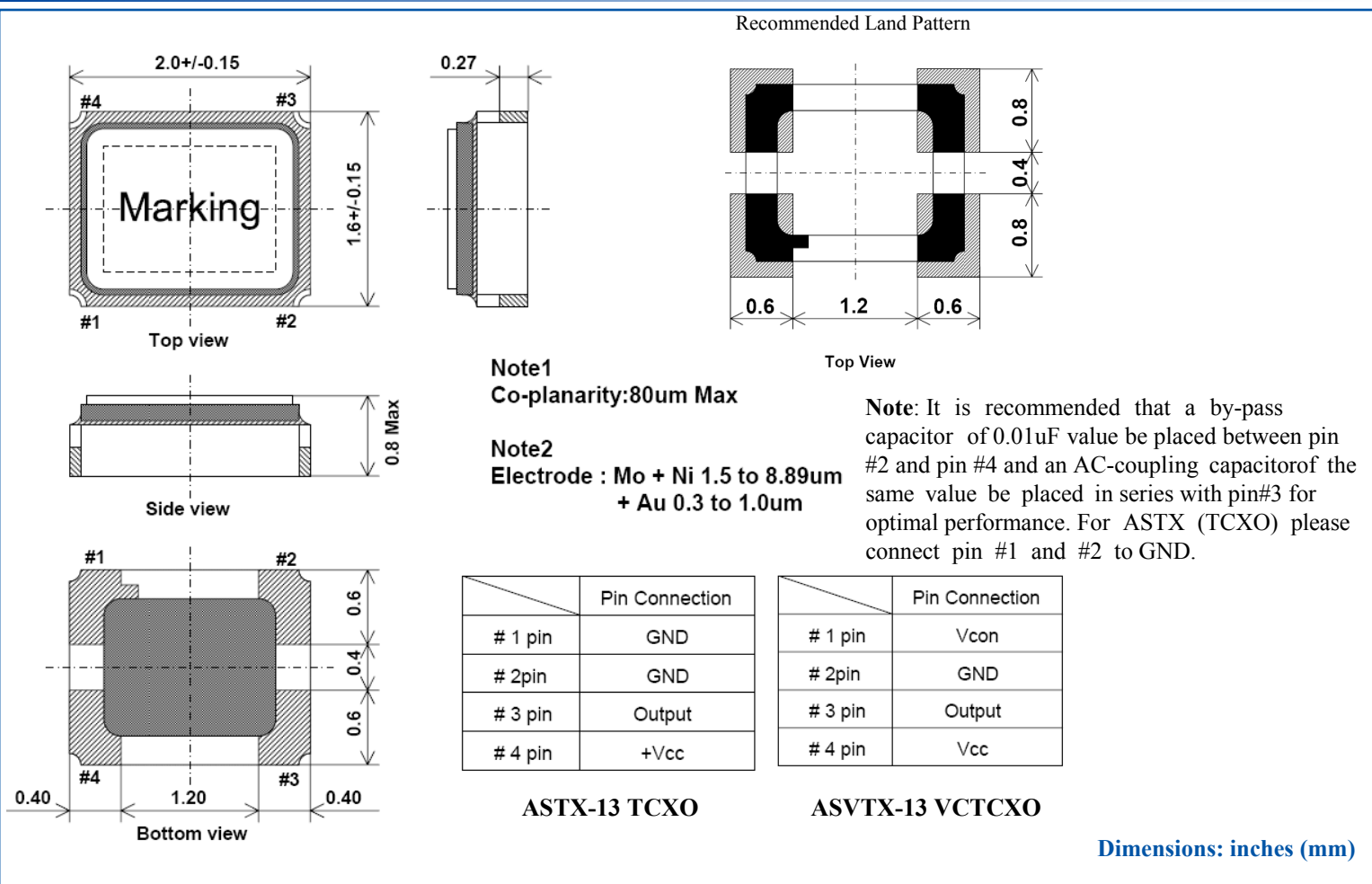


VCTCXO



TCXO

### OUTLINE DIMENSION:

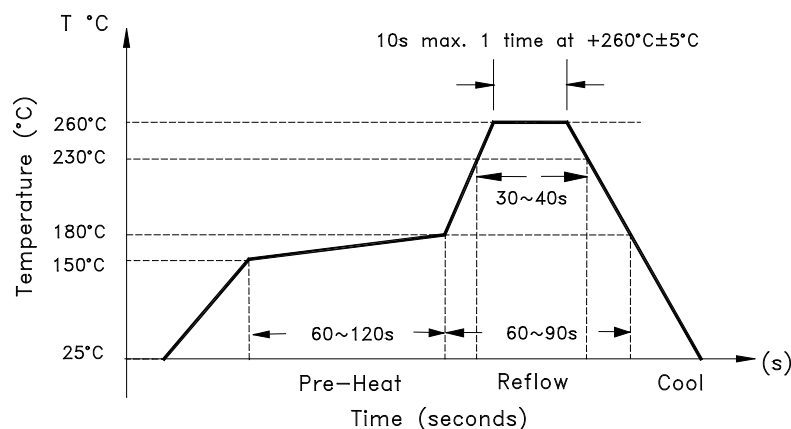


Dimensions: inches (mm)





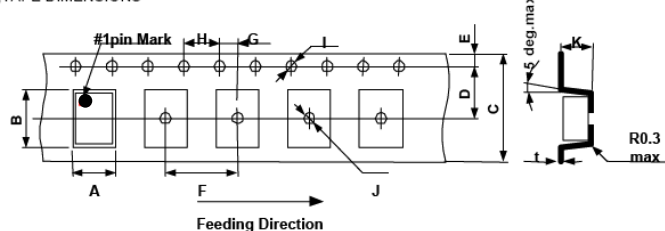
### REFLOW PROFILE:



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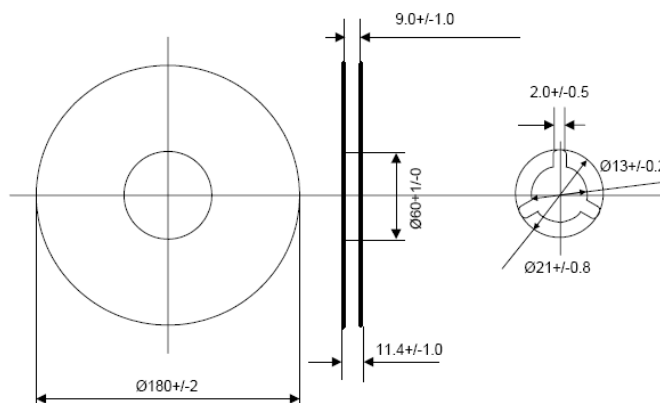
T: 1000pcs/reel  
T3: 3000pcs/reel  
T4: 4000pcs/reel (STD)

1. TAPE DIMENSIONS



| Symbol    | A        | B         | C       | D           | E           |
|-----------|----------|-----------|---------|-------------|-------------|
| Dimension | 2.0±0.05 | 2.4±0.05  | 8.0±0.2 | 3.5±0.05    | 1.75±0.1    |
| Symbol    | F        | G         | H       | I           | J           |
| Dimension | 4.0±0.1  | 2.0±0.05  | 4.0±0.1 | Φ1.5±0.1/-0 | Φ1.0±0.1/-0 |
| Symbol    | K        | t         |         |             |             |
| Dimension | 0.9±0.05 | 0.25±0.05 |         |             |             |

2. REELS DIMENSIONS



Dimensions: mm

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