

## Moisture Sensitivity Level (MSL) – 1

### OVERVIEW:

Abrakon's ASTXR series of Temperature Compensated Crystal Oscillators are based on an Advanced-Analog Temperature Compensation Integrated Circuit, incorporated with Rakon's Precision TCXO processing techniques.

This composite enables exceptional frequency stability over temperature ( $\leq \pm 0.50$  ppm over  $-40^{\circ}\text{C}$  to  $+85^{\circ}\text{C}$ ). Additionally, high-resolution screening algorithms are employed during the production verification process, ensuring that 100% of these devices are fully compliant to the stringent frequency stability specifications.

For Power Sensitive applications, the ASTXR series provides the ability to preserve consumed power by placing the device in shut-down mode; when not used. This series of devices are ideally suited for GPS and other mobile applications where performance, size, cost and power management are of critical importance.

### FEATURES:

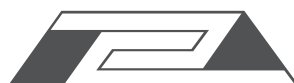
- Excellent phase noise performance
- Low power consumption
- Ultra miniature size: 2.05 x 1.65 x 0.8mm
- RoHS compliant
- Temperature stability:  $\pm 0.5$ ppm over  $-30 \sim +85^{\circ}\text{C}$

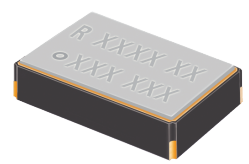
### APPLICATIONS:

- GPS
- Smartphone
- PND
- Communications
- Consumer electronics
- Wi-Fi
- WiMAX/W-LAN

### STANDARD SPECIFICATIONS:

| Parameters   | Minimum                      | Typical | Maximum   | Units                   | Notes  |
|--|------------------------------|---------|-----------|-------------------------|--|
| Nominal Frequency  | 26.000                       |         |           | MHz                     |  |
| Supply Voltage (Vdd)   | 1.75                         | 1.9     | 2.0       | V                       |  |
| Current Consumption (@Vdd max)   |                              |         | 1.5       | mA                      | See Note 2   |
| Operable Temperature Range   | -40                          |         | +85       | $^{\circ}\text{C}$      |  |
| Storage Temperature Range  | -40                          |         | +85       | $^{\circ}\text{C}$      |  |
| Initial Frequency Tolerance + Reflow Drift @ $+25^{\circ}\text{C} \pm 2^{\circ}\text{C}$ at time of shipment   |                              |         | $\pm 2$   | ppm                     | After 2 consecutive reflows and 1hr recovery @ $+25^{\circ}\text{C}$   |
| Frequency Stability over $-30^{\circ}\text{C}$ to $+85^{\circ}\text{C}$  |                              |         | $\pm 0.5$ | ppm                     | Ref. to $(F_{\text{MAX}} + F_{\text{MIN}}) / 2$ . See Note 1   |
| Frequency Stability over $-40^{\circ}\text{C}$ to $-30^{\circ}\text{C}$  |                              |         | $\pm 1$   | ppm                     | Temperature varied at maximum of $2^{\circ}\text{C}/\text{minute}$ over $-40^{\circ}\text{C}$ to $+30^{\circ}\text{C}$ |
| Frequency Slope (tested to a minimum of 1 freq. reading every $2^{\circ}\text{C}$ over $-30^{\circ}\text{C}$ to $+85^{\circ}\text{C}$ )                                      |                              |         | 0.1       | ppm/ $^{\circ}\text{C}$ | See Note 1   |
| Frequency Slope (tested to a minimum of 1 freq. reading every $2^{\circ}\text{C}$ over $-40^{\circ}\text{C}$ to $-30^{\circ}\text{C}$ )                                      |                              |         | 0.5       | ppm/ $^{\circ}\text{C}$ | See Note 1   |
| Static Temperature Hysteresis (Frequency change after reciprocal temperature ramped over the operating range. Frequency measured before and after at $+25^{\circ}\text{C}$ ) |                              |         | 0.6       | ppm                     |  |
| Sensitivity vs. Supply Voltage Variations (Vdd $\pm 5\%$ @ $+25^{\circ}\text{C}$ )   |                              |         | $\pm 0.1$ | ppm                     |  |
| Sensitivity vs. Load Variations ( $\pm 10\%$ load change @ $+25^{\circ}\text{C}$ )   |                              |         | $\pm 0.2$ | ppm                     | See Note 2   |
| Long Term Stability (frequency drift over 1 year @ $+25^{\circ}\text{C}$ )   |                              |         | $\pm 3$   | ppm                     |  |
| G-sensitivity  |                              |         | 2         | ppb/g                   | Gamma vector of all 3 axis from 30Hz to 1500Hz   |
| Output Type  | DC Coupled Clipped Sine-wave |         |           |                         | See Note 3   |
| Output Voltage Level (@ minimum Vdd)   | 0.8                          |         |           | V                       | See Note 2   |
| Output Load Resistance   | 9                            | 10      | 11        | k $\Omega$              |  |
| Output Load Capacitance  | 9                            | 10      | 11        | pF                      |  |
| Startup Time (amplitude)   |                              |         | 0.5       | ms                      | Within 90% of specified output level   |
| Startup Time (frequency)   |                              |         | 1.5       | ms                      | Within $\pm 0.5$ ppm of steady state frequency   |





| Parameters                           | Minimum | Typical | Maximum | Units    | Notes                                    |
|--------------------------------------|---------|---------|---------|----------|--|
| Enable/Disable Function (Pin 1)      |         |         |         |          |  |
| Input Voltage High (VIH)             | 80%*Vdd |         | Vdd     | V        | Normal operating Mode                    |
| Input Voltage Low (VIL)              | GND     |         | 20%*Vdd | V        | Power Down Mode                          |
| Stand-by Current                     |         | <0.01   | 2       | μA       |  |
| Enable Time (amplitude)              |         |         | 0.5     | ms       | Within 90% of specified output level     |
| Enable Time (frequency)              |         |         | 2       | ms       | Within ±0.5ppm of steady state frequency |
| Phase Noise @ 26MHz Carrier (@+25°C) |         |         |         |          |  |
| @ 1 Hz offset                        |         | -65     |         | dBc / Hz |  |
| @ 10 Hz offset                       |         | -93     |         | dBc / Hz |  |
| @ 100 Hz offset                      |         | -117    |         | dBc / Hz |  |
| @ 1,000 Hz offset                    |         | -137    |         | dBc / Hz |  |
| @ 10,000 Hz offset                   |         | -149    |         | dBc / Hz |  |
| @ 100,000 Hz offset                  |         | -151    |         | dBc / Hz |  |

Note:

1. Parts should be shielded from drafts causing unexpected thermal gradients. Temperature changes due to ambient air currents on the oscillator can lead to short term frequency drift
2. Specified for load stated in the Oscillator Output section at +25°C
3. External AC-Coupling capacitor required. ≥ 1nF is recommended
4. Frequency shift ≤ 1ppm after reliability test conditions (see section 7.0)

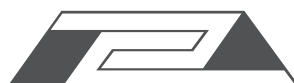
➤ **REFERENCE DESIGN INFORMATION:**

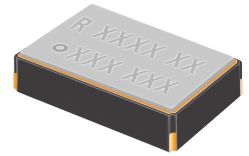
ASTXR-13-26.000MHZ-509764 is equivalent to Rakon P/N 509764.

➤ **PART IDENTIFICATIONS:**

ASTXR-13-26.000MHz -509764 - 

| Packing                  |
|--------------------------|
| Blank: Bulk              |
| T: Tape & Reel (4k/reel) |





## OUTLINE DIMENSION:

TOP VIEW

FRONT VIEW

BOTTOM VIEW

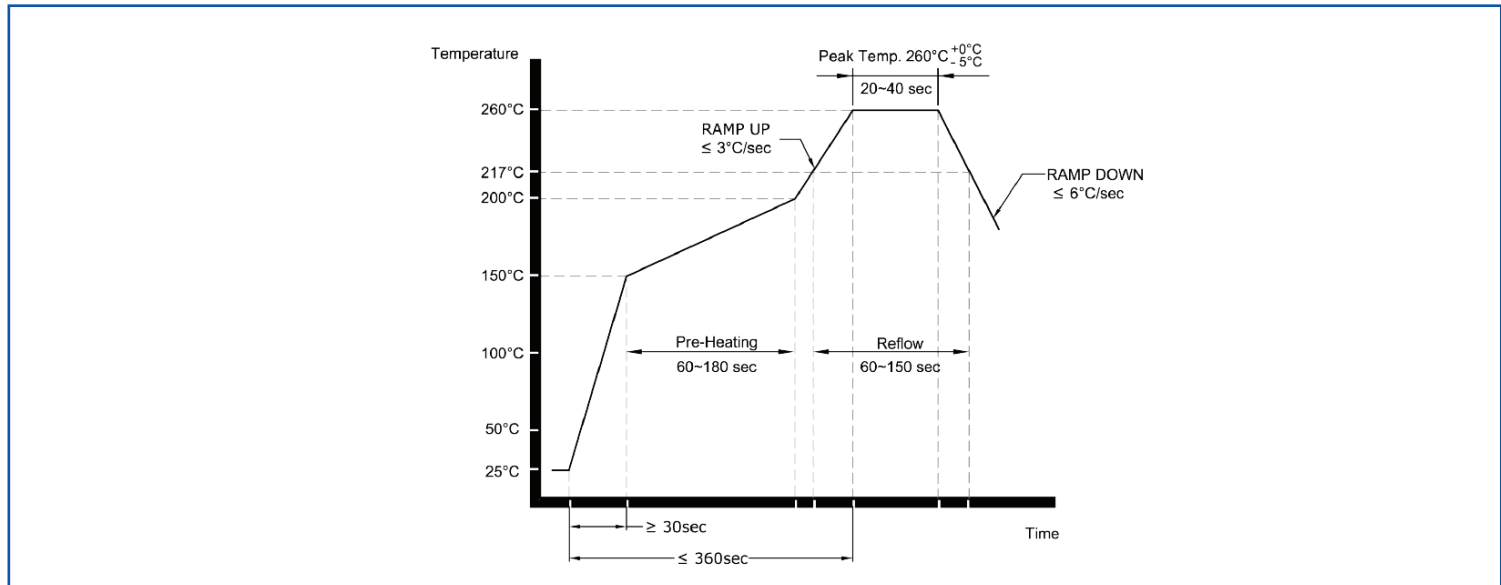
### Recommended Land Pattern

Recommended No Tracks Including Plains Under Device

| Pin | Function       |
|-----|----------------|
| 1   | Enable/Disable |
| 2   | GND            |
| 3   | Output         |
| 4   | Vdd            |

**Dimensions: mm**

## REFLOW PROFILE:

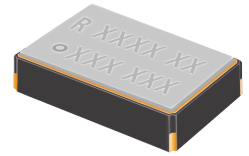


# SMD TCXO

ASTXR-13-26.000MHz-509764



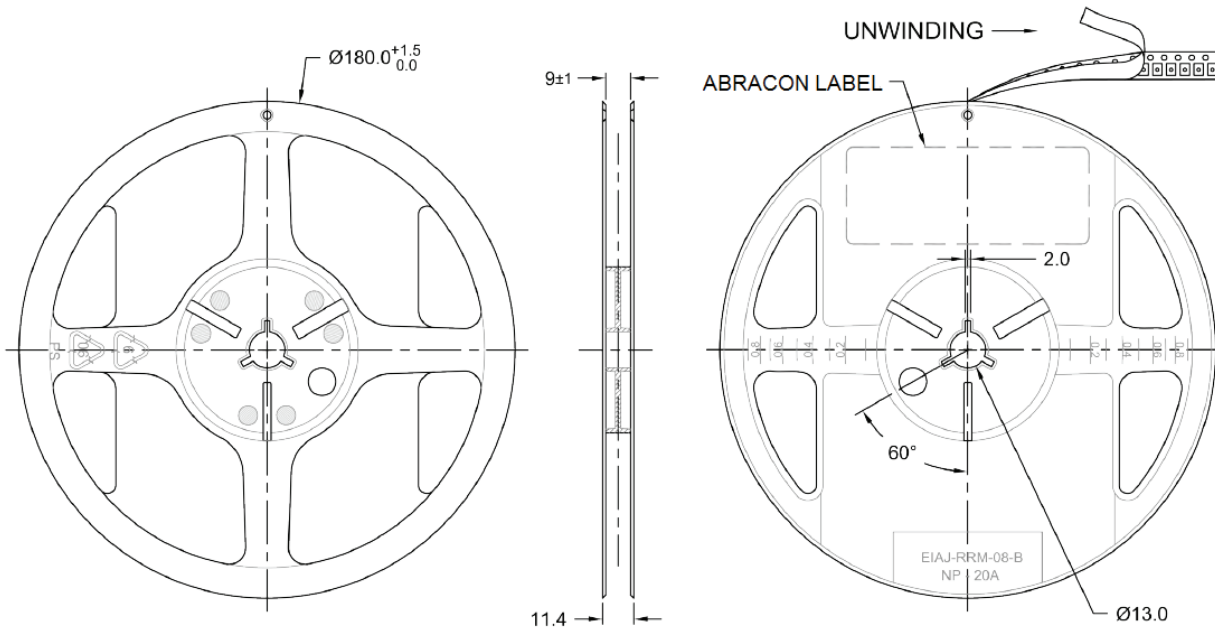
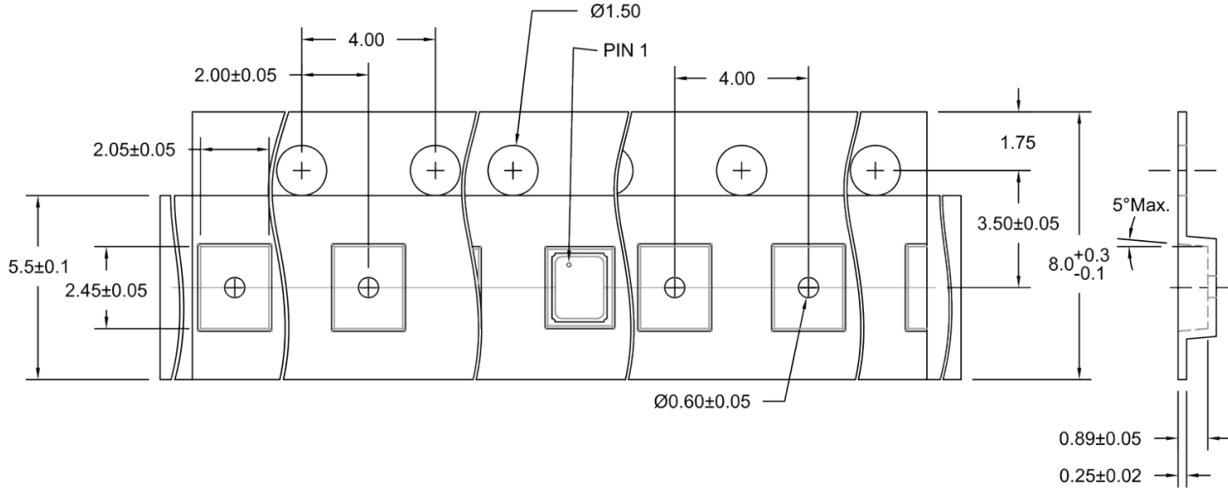
RoHS / RoHS II Compliant



2.05 x 1.65 x 0.8 mm SMD

## TAPE & REEL:

**4000pcs/reel**



Dimensions: mm

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