

## Moisture Sensitivity Level (MSL) – 1

### OVERVIEW:

Abracon'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
- Miniature size: 2.5 x 2.0 x 0.8mm SMD
- RoHS compliant
- Temperature stability:  $\pm 0.5$ ppm over  $-30 \sim +85^{\circ}\text{C}$

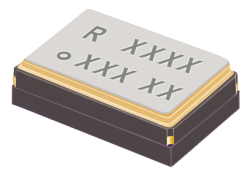
### APPLICATIONS:

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

### STANDARD SPECIFICATIONS:

Parameters	Minimum	Typical	Maximum	Units	Notes
Nominal Frequency	19.200			MHz	
Supply Voltage (Vdd)	1.71	1.8	1.89	V	
Current Consumption (@Vdd max)			1.5	mA	See Note 2
Operable Temperature Range	-30		+85	$^{\circ}\text{C}$	
Storage Temperature Range	-40		+85	$^{\circ}\text{C}$	
Initial Frequency Tolerance @+25 $^{\circ}\text{C} \pm 2^{\circ}\text{C}$ at time of shipment			$\pm 1$	ppm	
Reflow Shift			$\pm 1$	ppm	After 2 consecutive reflows and 1hr recovery@+25 $^{\circ}\text{C}$
Frequency Stability over Operating Temperature Range			$\pm 0.5$	ppm	Ref. to $(F_{\text{MAX}} + F_{\text{MIN}}) / 2$ . See Note 1
Frequency Slope (tested to a minimum of 1 freq. reading every 2 $^{\circ}\text{C}$ over -10 $^{\circ}\text{C}$ to +60 $^{\circ}\text{C}$ )			0.05	ppm/ $^{\circ}\text{C}$	See Note 1
Frequency Drift (calculated from freq. slope with temp. varied at a maximum of 1.92 $^{\circ}\text{C}/\text{min}$ (0.032 $^{\circ}\text{C}/\text{s}$ ) over -10 $^{\circ}\text{C}$ to +60 $^{\circ}\text{C}$ )			1.6	ppb/s	See Note 5
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 Drift (calculated from freq. slope with temp. varied at a maximum of 0.96 $^{\circ}\text{C}/\text{min}$ (0.016 $^{\circ}\text{C}/\text{s}$ ) over -30 $^{\circ}\text{C}$ to +85 $^{\circ}\text{C}$ )			1.6	ppb/s	See Note 5
Small Thermal Cycle Frequency Slope (measured at 0.5 $^{\circ}\text{C}$ intervals over any 5 $^{\circ}\text{C}$ heating and 5 $^{\circ}\text{C}$ cooling cycle, at a minimum rate of 1 $^{\circ}\text{C}/\text{min}$ within the operating temperature range)			50	ppb/ $^{\circ}\text{C}$	See Note 6
Small Thermal Cycle Hysteresis (Difference in Frequency measurement over any 5 $^{\circ}\text{C}$ heating and cooling cycle, at a minimum rate of 1 $^{\circ}\text{C}/\text{min}$ within the operating temperature range)			50	ppb (pk-pk)	
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





Parameters	Minimum	Typical	Maximum	Units	Notes
Long Term Stability (frequency drift over 1 year @ +25°C)			±1	ppm	
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	kΩ	
Output Load Capacitance	9	10	11	pF	
Startup Time (amplitude)			0.5	ms	Within 90% of specified output level
Startup Time (frequency)			2	ms	Within ±0.5ppm of steady state frequency
Phase Noise @ 19.2MHz Carrier (@+25°C)					
@ 1 Hz offset		-64		dBc / Hz	
@ 10 Hz offset		-94		dBc / Hz	
@ 100 Hz offset		-117		dBc / Hz	
@ 1,000 Hz offset		-139		dBc / Hz	
@ 10,000 Hz offset		-150		dBc / Hz	
@ 100,000 Hz offset		-152		dBc / Hz	

- Note:
- 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
  - Specified for load stated in the Oscillator Output section at +25°C
  - AC-Coupled outputs require an external capacitor, ≥ 1nF recommended
  - Frequency shift ≤ 1ppm after reliability test conditions (see section 7.0)
  - Frequency drift rate is calculated from the equation  $\text{ppb/s} = \text{°C/s} \times \text{ppb/°C}$
  - Discard the first 0.5°C interval of each heating and cooling cycle

## CROSS REFERENCE INFORMATION:

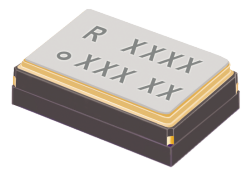
ASTXR-12-19.200MHz-512242 is equivalent to Rakon P/N 512242.

## PART IDENTIFICATIONS:

ASTXR-12-19.200MHz -512242 -

Packing
Blank: Bulk
T: Tape & Reel (3k/reel)





## OUTLINE DIMENSION:

**TOP VIEW**

**FRONT VIEW**

**BOTTOM VIEW**

### Recommended Land Pattern

**External Bypass Cap 100nF**

**To GND**

**Recommended No Tracks Including Plains Under Device**

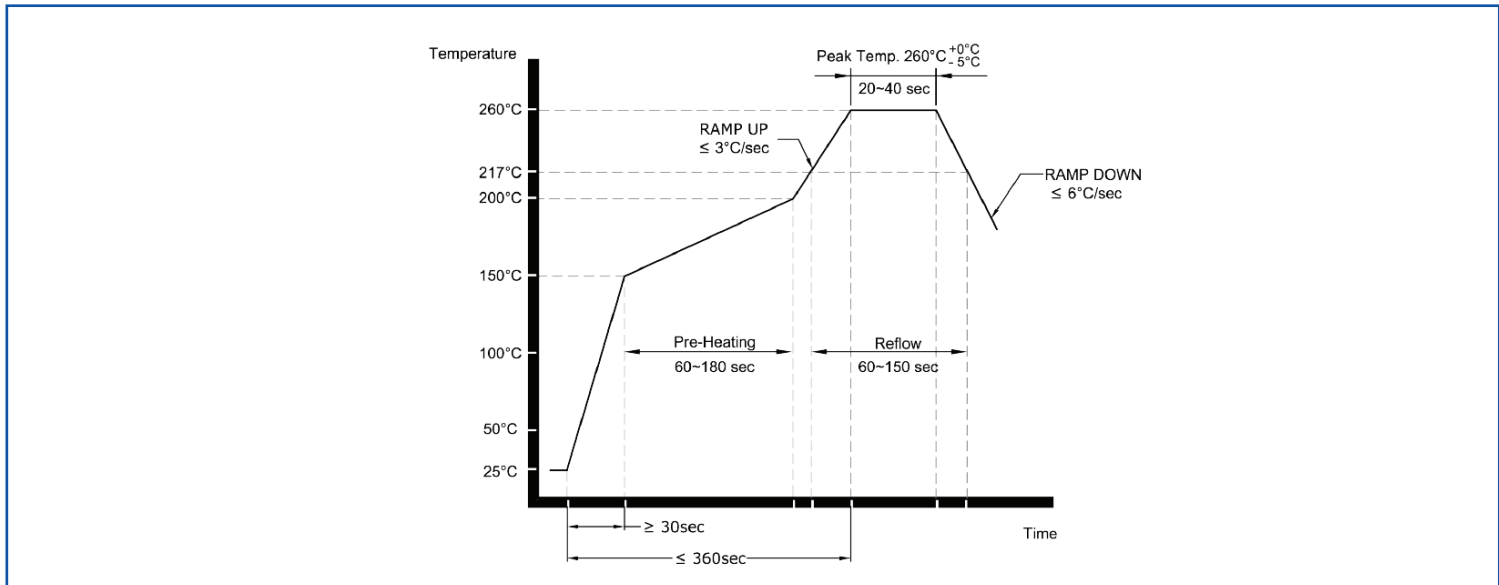
**Output to Circuit**

**External AC-Coupling Capacitor ≥ 1nF**

Pin	Function
1	NC/GND
2	NC/GND
3	GND
4	Output
5	NC/GND
6	Vdd

**Dimensions: mm**

## REFLOW PROFILE:

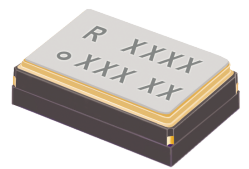


# SMD TCXO

ASTXR-12-19.200MHz-512242



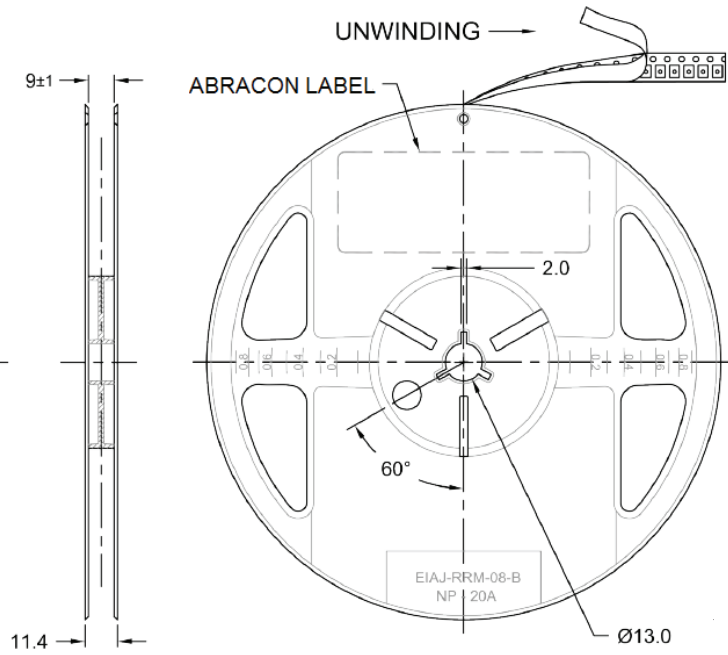
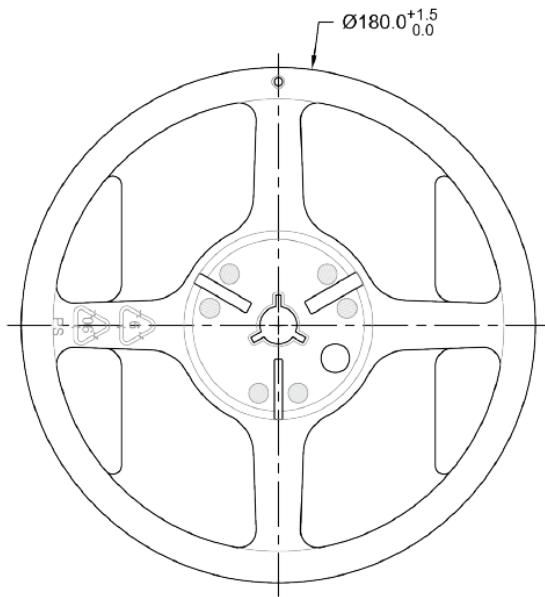
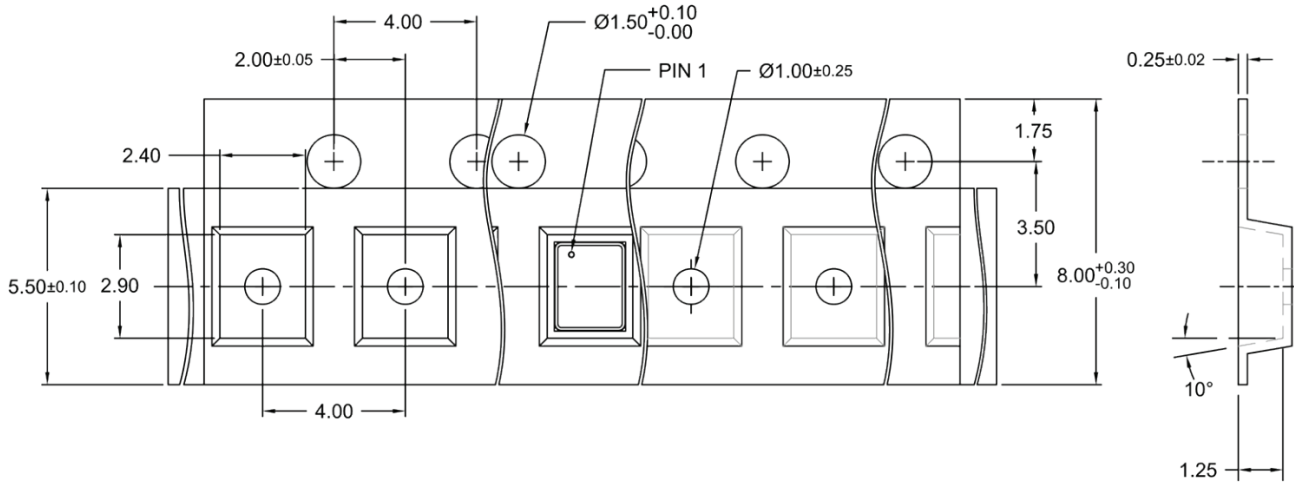
RoHS / RoHS II Compliant



2.5 x 2.0 x 0.8mm SMD

## TAPE & REEL:

**3000pcs/reel**



Dimensions: mm

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