

## 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:

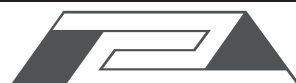
- Excellent phase noise performance
- Low power consumption
- Miniature size: 2.5 x 2.0 x 0.8mm SMD
- RoHS compliant
- Temperature stability:  $\pm 0.5$ ppm over  $-40 \sim +85^{\circ}\text{C}$

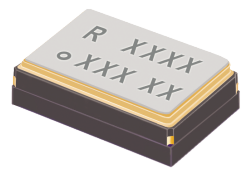
### APPLICATIONS:

- 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)	1.71	1.8	1.89	V	See Note 5
Current Consumption (@Vdd max)			1.5	mA	See Note 6
Operable Temperature Range	-40		+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, 2
Frequency Slope (tested to a minimum of 1 freq. reading every 2 $^{\circ}\text{C}$ over operating temperature range)			0.1	ppm/ $^{\circ}\text{C}$	See Note 1, 4
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	See Note 4
Sensitivity vs. Load Variations ( $\pm 10\%$ load change @ +25 $^{\circ}\text{C}$ )			$\pm 0.2$	ppm	
Long Term Stability (frequency drift over 1 year @ +25 $^{\circ}\text{C}$ )			$\pm 2$	ppm	See Note 4
Frequency Drift on Power up			500	ppb/s	Drift period: 0.03 to 1.0 second
			40		Drift period: 1.0 to 2.0 seconds
			2.5		Drift period: 2.0 to 3.0 seconds
Output Type	DC Coupled Clipped Sine-wave				See Note 7
Output Voltage Level (@ minimum Vdd)	0.8			V	See Note 6
Output Load Resistance	9.5	10	10.5	k $\Omega$	
Output Load Capacitance	9.5	10	10.5	pF	
Startup Time (amplitude)			0.5	ms	90% of specified output level
Startup Time (frequency)			2	ms	Within $\pm 0.5$ ppm of steady state frequency





Parameters	Minimum	Typical	Maximum	Units	Notes
Enable/Disable Function (Pin 2)					
Input Voltage High (VIH)	90%*Vdd		Vdd	V	Normal operating Mode
Input Voltage Low (VIL)	GND		10%*Vdd	V	Power Down Mode
Enable Time (frequency)		1.5		ms	Within ±0.5ppm of steady state frequency
Power Down Delay		2.5~10		ms	Delay prior to oscillator power down
Temperature Sensor					
Output Voltage @ +25°C	0.75		0.85	V	
Slope for -30 to +85°C	-8.5	-8.33	-8.1	mV/°C	
Load Resistance	100			kΩ	Sensor output and reference voltage pin. See Note 8
Load Capacitance			30	pF	
Noise	@1Hz		1.0	μV/√Hz	
	@10Hz		0.33	μV/√Hz	
	@100Hz		0.15	μV/√Hz	
Output Impedance @ +25°C			1.5	kΩ	
Linearity over operating temperature range		0.2		%	
Phase Noise @ 26MHz Carrier (@+25°C)					
@ 1	Hz offset		-67		dBc / Hz
@ 10	Hz offset		-92		dBc / Hz
@ 100	Hz offset		-115		dBc / Hz
@ 1,000	Hz offset		-135		dBc / Hz
@ 10,000	Hz offset		-148		dBc / Hz
@ 100,000	Hz offset		-151		dBc / Hz

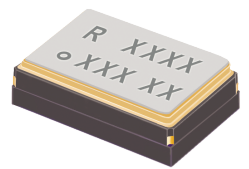
Note:

1. A maximum frequency stability over the temperature is required to be specified. Standard options are ±0.5ppm, ±1.0ppm, ±1.5ppm, and ±2.5ppm.
2. 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.
3. The operating temperature range needs to be specified. The extremes for this model are -40 and +85° C.
4. The maximum value is the specification. A minimum value, if present indicates the best specification available.
5. The unit will operate on any voltage between minimum and maximum values.
6. Specified for load stated in the Oscillator Output section at +25° C.
7. External AC-Coupling capacitor required. ≥ 1nF is recommended.
8. The recommended load resistance is ≥ 100kΩ. The load capacitance must be minimized for optional performance.

➤ REFERENCE DESIGN INFORMATION:

ASTXR-12-26.000MHz-512545 is equivalent to Rakon P/N 512545.





## PART IDENTIFICATIONS:

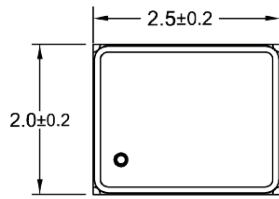
ASTXR-12-26.000MHz -512545 -  

### Packing

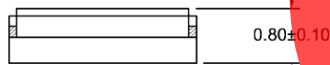
Blank: Bulk

T: Tape & Reel (3k/reel)

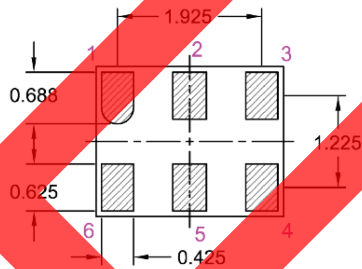
## OUTLINE DIMENSION:



TOP VIEW

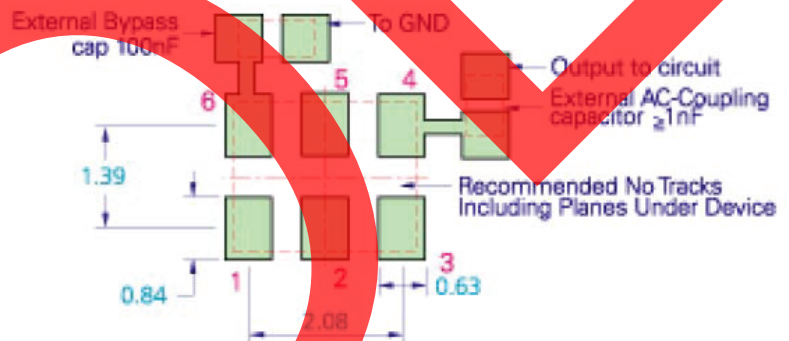


FRONT VIEW



BOTTOM VIEW

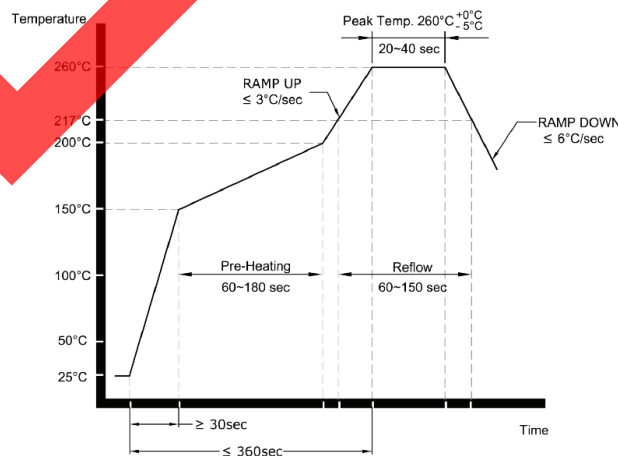
### Recommended Land Pattern



Pin	Function
1	GND
2	Enable/Disable
3	GND
4	Output
5	Temp. Sensor
6	Vdd

Dimensions: mm

## REFLOW PROFILE:

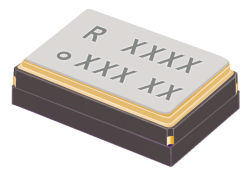


# SMD TCXO

ASTXR-12-26.000MHz-512545



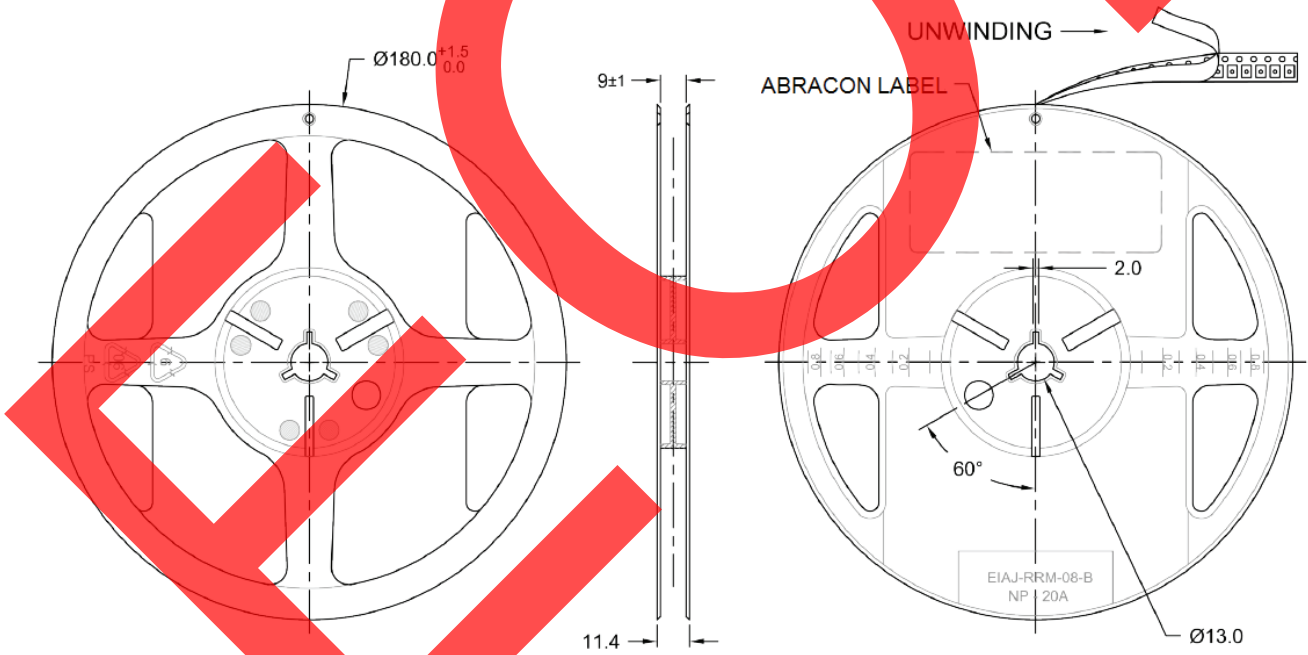
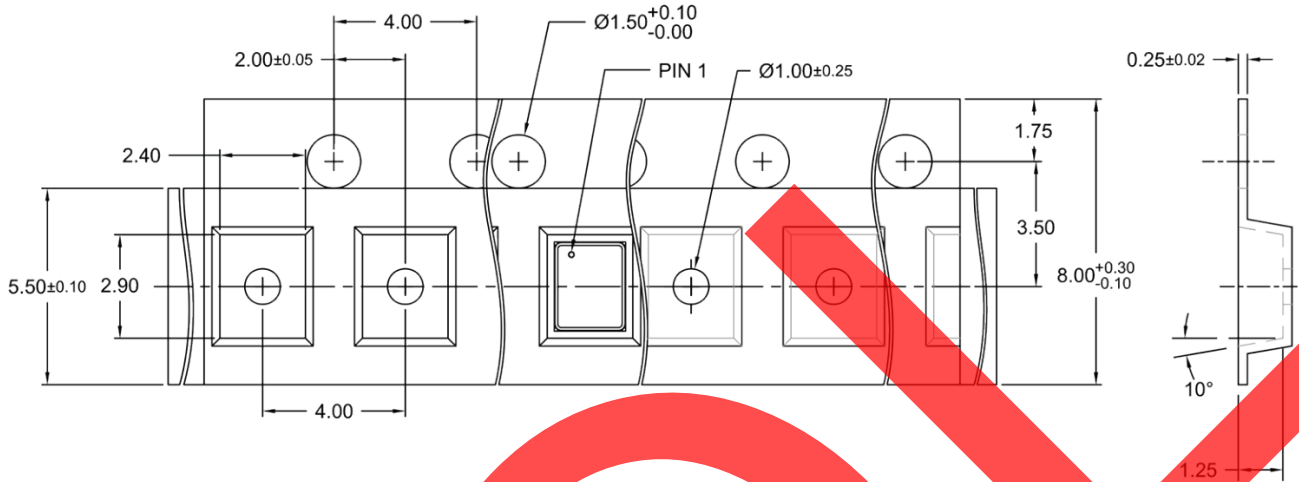
RoHS / RoHS II Compliant



2.5 x 2.0 x 0.8mm SMD

## TAPE & REEL:

**3000pcs/reel**



Dimensions: mm

**ATTENTION:** Abracon Corporation's products are COTS – Commercial-Off-The-Shelf products; suitable for Commercial, Industrial and, where designated, Automotive Applications. Abracon's products are not specifically designed for Military, Aviation, Aerospace, Life-dependant Medical applications or any application requiring high reliability where component failure could result in loss of life and/or property. For applications requiring high reliability and/or presenting an extreme operating environment, written consent and authorization from Abracon Corporation is required. Please contact Abracon Corporation for more information.

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