

SMD TCXO/VCTCXO

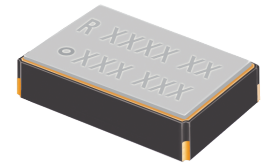
ASTXR-13



ESD Sensitive



RoHS / RoHS II Compliant



2.05 x 1.65 x 0.8mm

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°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 choices are ± 0.5 ppm to ± 2 ppm depending on operating temperature range

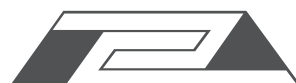
APPLICATIONS:

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

STANDARD SPECIFICATIONS:

Parameters	Minimum	Typical	Maximum	Units	Notes
Frequency Range	13		52	MHz	
Supply Voltage (Vdd)	1.8		3	V	
Current Consumption (@Vdd max)			2.2	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			± 2	ppm	After 2 consecutive reflows and 1hr recovery @ $+25^{\circ}\text{C}$
Frequency Stability over Operating Temperature Range	± 0.5		± 2	ppm	Ref. to $(F_{\text{MAX}} + F_{\text{MIN}}) / 2$. Vc is set to midpoint of control voltage range See Note 1
Frequency Slope (tested to a minimum of 1 freq. reading every 2°C over operating temperature range)	0.05		1	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 $\pm 5\%$ @ $+25^{\circ}\text{C}$)			± 0.1	ppm	
Sensitivity vs. Load Variations ($\pm 10\%$ load change @ $+25^{\circ}\text{C}$)			± 0.2	ppm	See Note 2
Long Term Stability (frequency drift over 1 year @ $+25^{\circ}\text{C}$)			± 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	k Ω	
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 ± 0.5 ppm of steady state frequency

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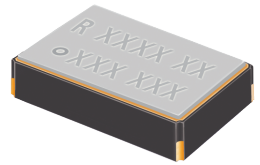
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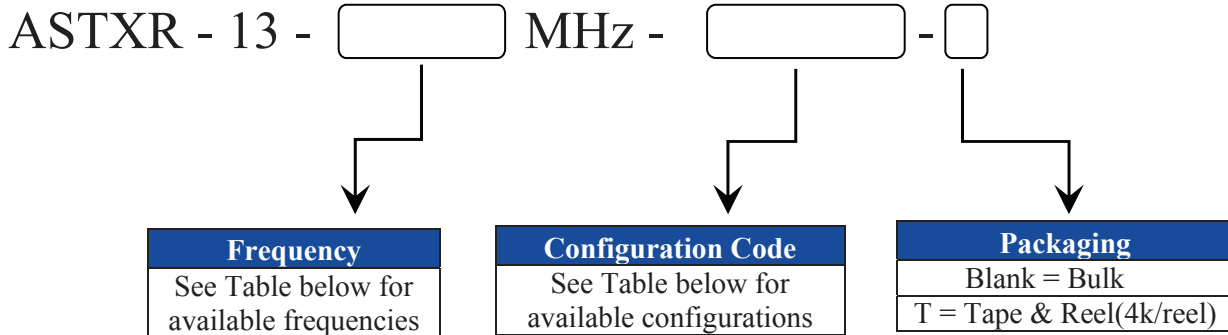
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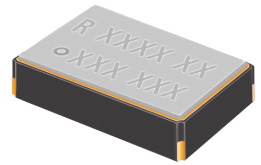
Parameters		Minimum	Typical	Maximum	Units	Notes
Enable/Disable Function						
Input Voltage High (VIH)		80%*Vdd		Vdd	V	Normal operating Mode
Input Voltage Low (VIL)		GND		20%*Vdd	V	Power Down Mode
Stand-by Current			<0.01	2	μA	
Enable Time (amplitude)				0.5	ms	Within 90% of specified output level
Enable Time (frequency)				2	ms	Within ±0.5ppm of steady state frequency
Control Voltage Range (Vc)	Vdd ≤ 2.3V	0.3		1.5	V	The nominal Vc value is midway between the min and max. Vc should not exceed Vdd+0.2V or GND
	Vdd > 2.3V	0.4		2.4	V	
Frequency Tuning		±10			ppm	Freq. shift from min to max of control voltages
Control Voltage Input Port Impedance			500		kΩ	
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:

- 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
- External AC-Coupling capacitor required. ≥ 1nF is recommended
- Frequency shift ≤ 1ppm after reliability test conditions (see section 7.0)

PART IDENTIFICATIONS:





2.05 x 1.65 x 0.8mm

Table of Available Configurations

Abracon P/N	Freq. Stability Over Temperature (ppm)	Slope (ppm/°C)	Operating Temperature (°C)	Supply Voltage (V)	Enable/Disable	Temp. Sensor	Voltage Control
ASTXR-13-26.000MHz-507869	± 0.5	± 0.1	-30 to +85	1.8	no	no	no
ASTXR-13--16.369MHz-508200	± 0.5	± 0.1	-40 to +85	1.8	no	no	no
ASTXR-26.000MHz-509430	± 0.5	± 0.1	-30 to +85	1.8	no	no	no
ASTXR-13-26.000MHz-512546	± 0.5	± 0.1	-40 to +85	1.8	Pin 1	no	no
ASTXR-13-26.000MHz-509160	± 0.5	± 0.1	-40 to +85	1.8	Pin 2	Pin 1	no
ASTXR-13-19.200MHz-508205	± 0.5	± 0.1	-30 to +85	1.8	no	no	no
ASTXR-13-19.200MHz-508206	± 0.5	± 0.1	-30 to +85	2.85	no	no	no
ASTXR-13-19.200MHz-508222	± 0.5	± 0.1	-30 to +85	1.8	no	no	yes
ASTXR-13-19.200MHz-507867	± 0.5	± 0.1	-30 to +85	2.85	no	no	yes
ASTXR-13-26.000MHz-509764	± 0.5	± 0.1	-30 to +85	1.9	Pin 1	no	no
ASTXR-13-26.000MHz-511891	± 0.5	± 0.1	-30 to +85	3.0	Pin 1	no	no

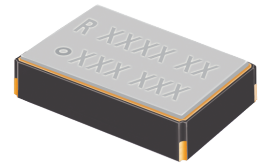


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REFERENCE DESIGN INFORMATION:

Abrakon P/N	Equivalent Rakon P/N	Recommended Alternative	Chipset	Reference Design Chipset P/N
ASTXR-13-26.000MHz-507869	507869		Broadcom	BCM2075, BCM2076, BCM4750, BCM4751, BCM47511, BCM4752, BCM47521, BCM4760
ASTXR-13-16.369MHz-508200	508200		CSR	SirfStar 3 (SS3), SirfStar 4 (SS4), SirfStar 5 (SS5)
ASTXR-13-26.000MHz-509430	509430	512546	CSR	SirfStar 3 (SS3), SirfStar 4 (SS4), SirfStar 5 (SS5)
ASTXR-13-26.000MHz-512546	512546		CSR	SirfStar 3 (SS3), SirfStar 4 (SS4), SirfStar 5 (SS5)
ASTXR-13-26.000MHz-509160	509160		CSR	SirfStar 5 (SS5)
ASTXR-13-19.200MHz-508205	508205		Qualcomm	APQ Family, APQ8064
ASTXR-13-19.200MHz-508206	508206		Qualcomm	APQ Family, APQ8064
ASTXR-13-19.200MHz-508222	508222		Qualcomm	MDM Family, MDM6xxx, MDM7xxx, MDM8xxx, MDM6085, MDM6270, MDM6200, MDM6600, MDM8200A, MDM8220, MDM8215, MDM8227
ASTXR-13-19.200MHz-507867	507867		Qualcomm	MDM Family, MDM6xxx, MDM7xxx, MDM8xxx, MDM6085, MDM6270, MDM6200, MDM6600, MDM8200A, MDM8220, MDM8215, MDM8228
ASTXR-13-26.000MHz-509764	509764		uBlox	u-blox 6 (UBX-M6000, UBX-M6010), u-blox 7 (UBX-M7020), u-blox 8 (UBX-M8030)
ASTXR-13-26.000MHz-511891	511891		uBlox	u-blox 6 (UBX-M6000, UBX-M6010), u-blox 7 (UBX-M7020), u-blox 8 (UBX-M8030)

OUTLINE DIMENSION:

TOP VIEW

FRONT VIEW

BOTTOM VIEW

Recommended Land Pattern

External Bypass Cap 100nF
To GND
Output to Circuit
External AC-Coupling Capacitor $\geq 1nF$

Recommended No Tracks Including Plains Under Device

Pin	Function
1	NC/GND Enable/Disable Vc
2	GND
3	Output
4	Vdd

Dimensions: mm

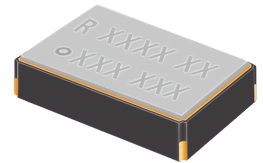


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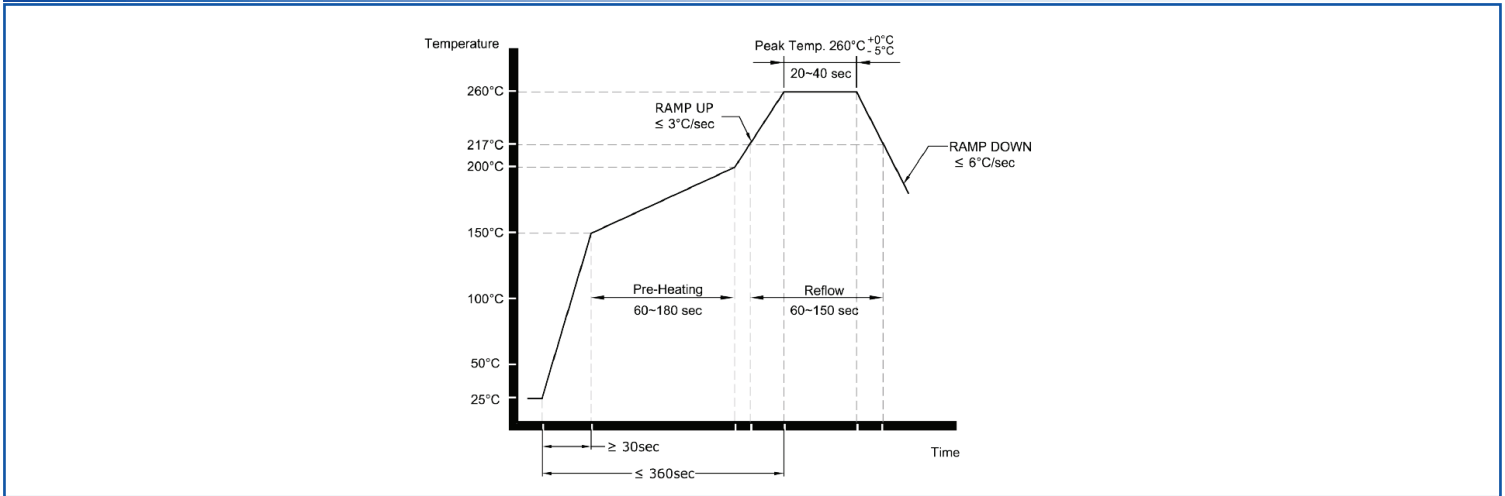


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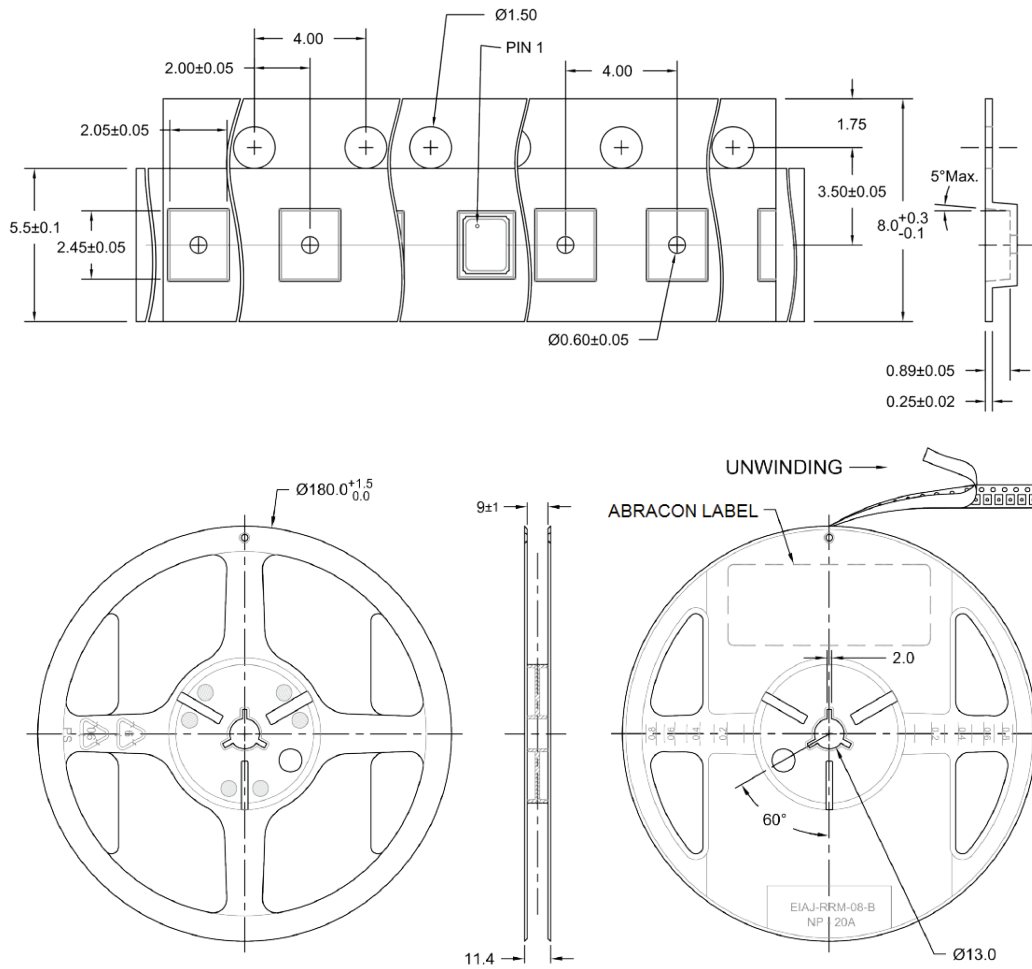
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REFLOW PROFILE:



TAPE & REEL:

4000pcs/reel



Dimensions: mm

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