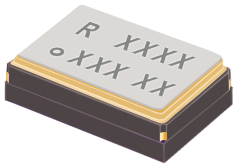
SMD TCXO/VCTCXO

ASTXR-12

ESD Sensitive

RoHS / RoHS II Compliant



2.5 x 2.0 x 0.9mm

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 (≤±0.50 ppm over -40°C to +85°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 0.9mm
- RoHS compliant
- Temperature stability choices are ±0.5ppm to ±2.5ppm 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	10		52	MHz	
Supply Voltage (Vdd)	1.8		3.3	V	
Current Consumption (@Vdd max)			2	mA	See Note 2
Operable Temperature Range	-40		+85	° C	
Storage Temperature Range	-40		+85	° C	
Initial Frequency Tolerance @+25℃±2℃ at time of shipment			±1	ppm	
Reflow Drift			±1	ppm	After 2 consecutive reflows and 1hr recovery@+25℃
Frequency Stability over Operating Temperature Range	±0.5		±2.5	ppm	Ref. to $(F_{MAX}+F_{MIN})/2$. Vc is set to midpoint of control voltage range See Note 1
Frequency Slope (tested to a minimum of 1 freq. reading every 2℃ over operating temperature range)	0.1		1	ppm/℃	See Note 1
Static Temperature Hysteresis (Frequency change after reciprocal temperature ramped over the operating range. Frequency measured before and after at +25℃)			0.6	ppm	
Sensitivity vs. Supply Voltage Variations (Vdd±5% @ +25℃)			±0.1	ppm	
Sensitivity vs. Load Variations (±10% load change @ +25℃)			±0.2	ppm	See Note 2
Long Term Stability (frequency drift over 1 year @ +25℃)			±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

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SMD TCXO/VCTCXO

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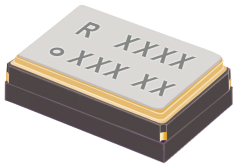

2.5 x 2.0 x 0.9mm

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	1	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:

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)

PART IDENTIFICATIONS:

ASTXR - 12 - [ ] MHz - [ ] - [ ]

Frequency	Configuration Code	Packaging
See Table below for available frequencies	See Table below for available configurations	Blank = Bulk T = Tape & Reel(3k/reel)

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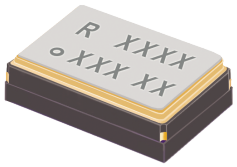

2.5 x 2.0 x 0.9mm

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-12-26.000MHz-508892	± 0.5	± 0.1	-30 to +85	1.8 V	no	no	no
ASTXR-12-26.000MHz-512883	± 0.5	± 0.1	-30 to +85	1.8 V	no	no	no
ASTXR-12-16.369MHz-508303	± 0.5	± 0.1	-40 to +85	1.8 V	Pin 1	no	no
ASTXR-12-16.369MHz-508314	± 0.5	± 0.1	-30 to +85	1.8 V	Pin 2	no	no
ASTXR-12-16.369MHz-511743	± 0.5	± 0.1	-40 to +85	1.8 V	Pin 1	no	no
ASTXR-12-16.369MHz-512543	± 0.5	± 0.1	-40 to +85	1.8 V	Pin 2	Pin 5	no
ASTXR-12-19.200MHz-512544	± 0.5	± 0.1	-40 to +85	1.8 V	Pin 2	Pin 5	no
ASTXR-12-26.000MHz-508139	± 0.5	± 0.1	-40 to +85	1.8 V	Pin 1	no	no
ASTXR-12-26.000MHz-508313	± 0.5	± 0.1	-40 to +85	1.8 V	Pin 2	no	no
ASTXR-12-26.000MHz-509161	± 0.5	± 0.1	-40 to +85	1.8 V	Pin 2	Pin 1	no
ASTXR-12-26.000MHz-511741	± 0.5	± 0.1	-40 to +85	1.8 V	Pin 1	no	no

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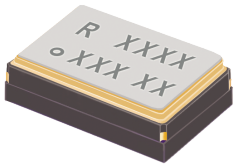

2.5 x 2.0 x 0.9mm

Table of Available Configurations (continued)

Abracon P/N	Freq. Stability Over Temperature (ppm)	Slope (ppm/°C)	Operating Temperature (°C)	Supply Voltage (V)	Enable/ Disable	Temp. Sensor	Voltage Control
ASTXR-12-26.000MHz-512545	± 0.5	± 0.1	-40 to +85	1.8 V	Pin 2	Pin 5	no
ASTXR-12-19.200MHz-508072	± 0.5	± 0.1	-30 to +85	1.8 V	no	no	no
ASTXR-12-19.200MHz-508207	± 0.5	± 0.1	-30 to +85	2.85 V	no	no	no
ASTXR-12-19.200MHz-512242	± 0.5	± 0.1	-30 to +85	1.8 V	no	no	no
ASTXR-12-19.200MHz-508221	± 0.5	± 0.1	-30 to +85	1.8 V	no	no	yes
ASTXR-12-19.200MHz-508220	± 0.5	± 0.1	-30 to +85	2.85 V	no	no	yes
ASTXR-12-19.200MHz-503461	± 0.5	± 0.1	-30 to +85	2.85 V	no	no	yes
ASTXR-12-19.200MHz-512222	± 0.5	± 0.1	-30 to +85	2.85 V	no	no	yes
ASTXR-12-19.200MHz-512240	± 0.5	± 0.1	-30 to +85	1.8 V	no	no	yes
ASTXR-12-19.200MHz-511890	± 0.5	± 0.1	-30 to +85	2.85 V	no	no	no
ASTXR-12-26.000MHz-504670	± 0.5	± 0.1	-30 to +85	3.0 V	no	no	no
ASTXR-12-26.000MHz-511911	± 0.5	± 0.1	-30 to +85	1.88 V	Pin 1	no	no
ASTXR-12-26.000MHz-503820	± 0.5	± 0.1	-30 to +85	1.9 V	Pin 2	no	no
ASTXR-12-16.369MHz-505160	± 0.5	± 0.1	-30 to +85	2.85 V	no	no	no
ASTXR-12-16.369MHz-506439	± 0.5	± 0.1	-30 to +85	1.8 V	Pin 2	no	no
ASTXR-12-26.000MHz-513028	± 0.5	± 0.1	-30 to +85	1.8 V	no	no	yes

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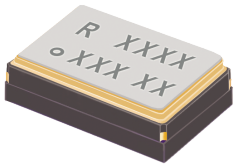

2.5 x 2.0 x 0.9mm

REFERENCE DESIGN INFORMATION:

Abracon P/N	Equivalent Rakon P/N	Recommended Alternative	Chipset	Reference Design Chipset P/N
ASTXR-12-26.000MHz-508892	508892	512883	Broadcom	BCM2075, BCM2076, BCM4750, BCM4751, BCM47511, BCM4752, BCM47521, BCM4760
ASTXR-12-26.000MHz-512883	512883		Broadcom	BCM2075, BCM2076, BCM4750, BCM4751, BCM47511, BCM4752, BCM47521, BCM4760
ASTXR-12-16.369MHz-508303	508303	511743	CSR	SirfStar 3 (SS3), SirfStar 4 (SS4), SirfStar 5 (SS5)
ASTXR-12-16.369MHz-508314	508314	511743	CSR	SirfStar 3 (SS3), SirfStar 4 (SS4), SirfStar 5 (SS5)
ASTXR-12-16.369MHz-511743	511743		CSR	SirfStar 3 (SS3), SirfStar 4 (SS4), SirfStar 5 (SS5)
ASTXR-12-16.369MHz-512543	512543		CSR	SirfStar 5 (SS5)
ASTXR-12-19.200MHz-512544	512544		CSR	SirfStar 5 (SS5)
ASTXR-12-26.000MHz-508139	508139	511741	CSR	SirfStar 3 (SS3), SirfStar 4 (SS4), SirfStar 5 (SS5)
ASTXR-12-26.000MHz-508313	508313	511741	CSR	SirfStar 3 (SS3), SirfStar 4 (SS4), SirfStar 5 (SS5)
ASTXR-12-26.000MHz-509161	509161	512545	CSR	SirfStar 5 (SS5)
ASTXR-12-26.000MHz-511741	511741		CSR	SirfStar 3 (SS3), SirfStar 4 (SS4), SirfStar 5 (SS5)
ASTXR-12-26.000MHz-512545	512545		CSR	SirfStar 5 (SS5)
ASTXR-12-19.200MHz-508072	508072	512242	Qualcomm	APQ Family, APQ8064
ASTXR-12-19.200MHz-508207	508207	511890	Qualcomm	APQ Family, APQ8064
ASTXR-12-19.200MHz-512242	512242		Qualcomm	APQ Family, APQ8064

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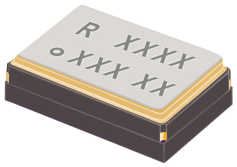

2.5 x 2.0 x 0.9mm

REFERENCE DESIGN INFORMATION CONTD:

Abracon P/N	Equivalent Rakon P/N	Recommended Alternative	Chipset	Reference Design Chipset P/N
ASTXR-12-19.200MHz-508221	**508221**	**512240**	Qualcomm	MDM Family, MDM6xxx, MDM7xxx, MDM8xxx, MDM6085, MDM6270,MDM6200, MDM6600, MDM8200A, MDM8220, MDM8215, MDM8229
ASTXR-12-19.200MHz-508220	**508220**	**512222**	Qualcomm	MDM Family, MDM6xxx, MDM7xxx, MDM8xxx, MDM6085, MDM6270,MDM6200, MDM6600, MDM8200A, MDM8220, MDM8215, MDM8230
ASTXR-12-19.200MHz-503461	**503461**	**512222**	Qualcomm	MDM Family, MDM6xxx, MDM7xxx, MDM8xxx, MDM6085, MDM6270,MDM6200, MDM6600, MDM8200A, MDM8220, MDM8215, MDM8231
ASTXR-12-19.200MHz-512222	**512222**		Qualcomm	MDM Family, MDM6xxx, MDM7xxx, MDM8xxx, MDM6085, MDM6270,MDM6200, MDM6600, MDM8200A, MDM8220, MDM8215, MDM8225
ASTXR-12-19.200MHz-512240	**512240**		Qualcomm	MDM Family, MDM6xxx, MDM7xxx, MDM8xxx, MDM6085, MDM6270,MDM6200, MDM6600, MDM8200A, MDM8220, MDM8215, MDM8226
ASTXR-12-19.200MHz-511890	**511890**		Qualcomm	APQ Family, APQ8064
ASTXR-12-26.000MHz-504670	**504670**	**511911**	uBlox	u-blox 6 (UBX-M6000, UBX-M6010), u-blox 7 (UBX-M7020), u-blox 8 (UBX-M8030)
ASTXR-12-26.000MHz-511911	**511911**		uBlox	u-blox 6 (UBX-M6000, UBX-M6010), u-blox 7 (UBX-M7020), u-blox 8 (UBX-M8030)
ASTXR-12-26.000MHz-503820	**503820**	**511911**	uBlox	u-blox 6 (UBX-M6000, UBX-M6010), u-blox 7 (UBX-M7020), u-blox 8 (UBX-M8030)
ASTXR-12-16.369MHz-505160	**505160**	**511743**		
ASTXR-12-16.369MHz-506439	**506439**	**511743**		
ASTXR-12-26.000MHz-513028	**513028**			

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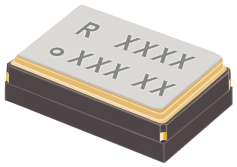
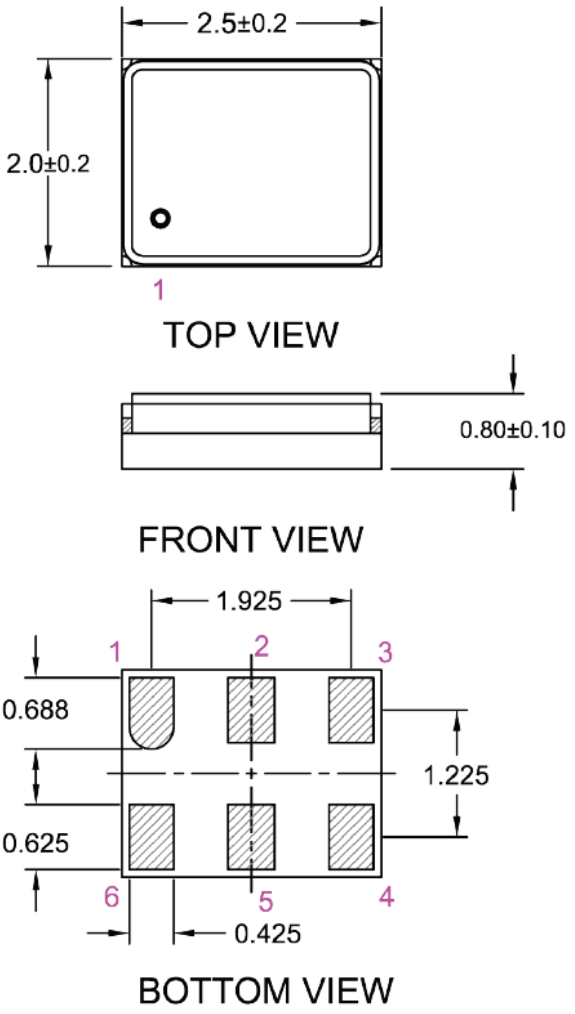
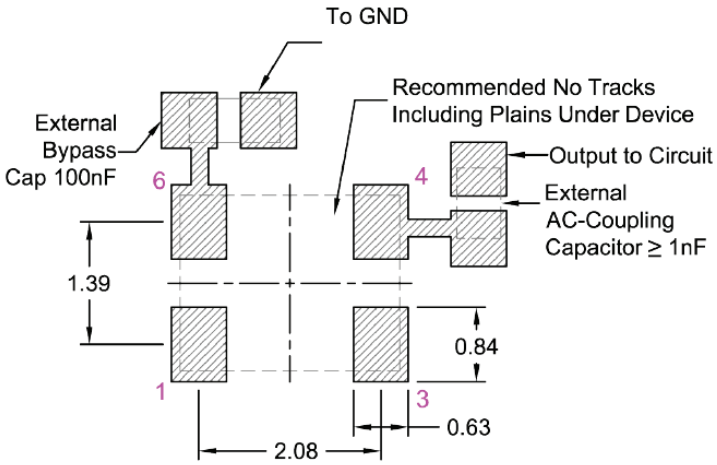


2.5 x 2.0 x 0.9mm

OUTLINE DIMENSION:



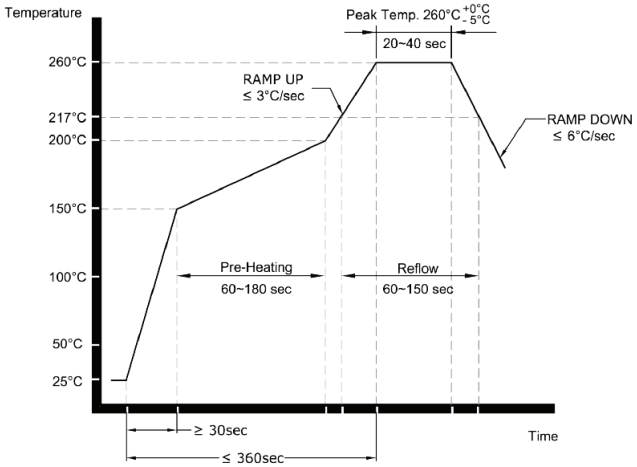
Recommended Land Pattern



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

Dimensions: mm

REFLOW PROFILE:



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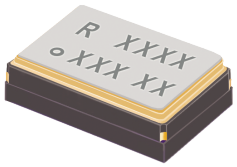
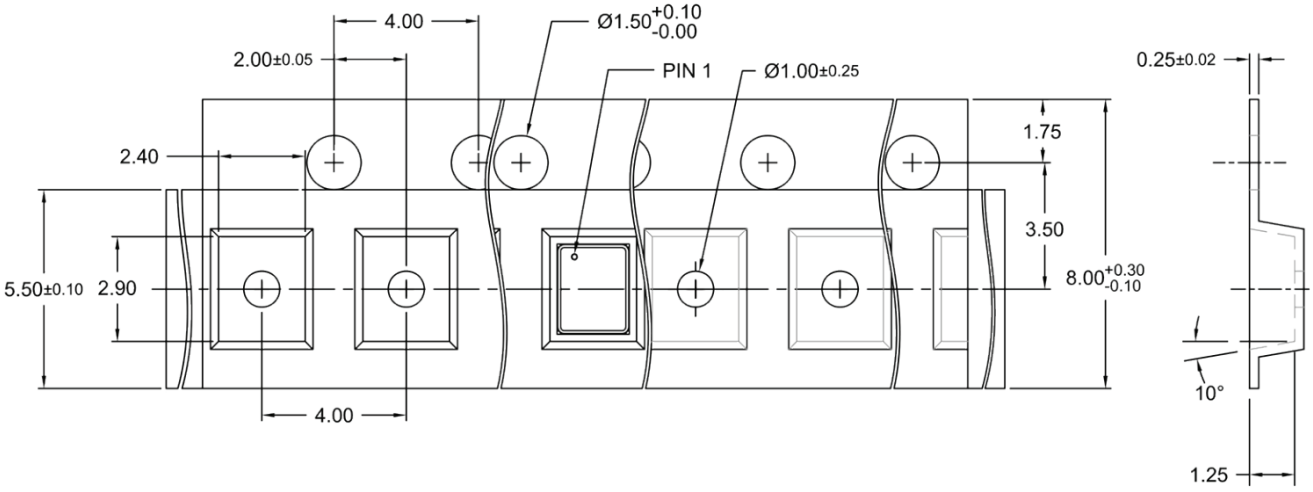
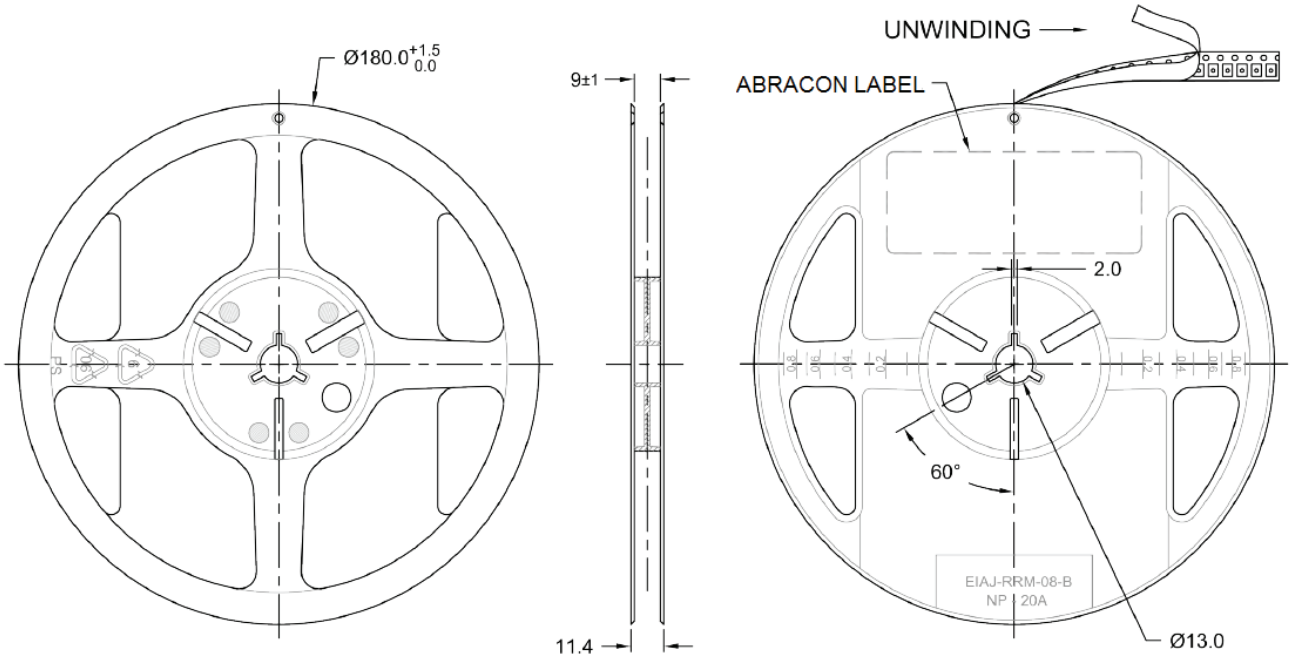


2.5 x 2.0 x 0.9mm

TAPE & REEL:

3000pcs/reel





Dimensions: mm

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