

## Moisture Sensitivity Level (MSL) – 1

### FEATURES:

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

### APPLICATIONS:

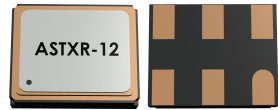
- Decawave DW1000 (IEEE802.15.4-2011 UWB)
- UWB applications
- Real Time Location Systems
- Wireless Sensor Networks

### STANDARD SPECIFICATIONS:

Parameters	Minimum	Typical	Maximum	Units	Notes
Nominal Frequency	38.400			MHz	
Supply Voltage (Vdd)	3.14	3.3	3.46	V	
Current Consumption (@Vdd max)			2.0	mA	See Note 2
Operating 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
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 $^\circ\text{C}$ )			$\pm 1.0$	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 $\Omega$	
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 $\pm 0.5$ ppm of steady state frequency
Phase Noise @ 38.400MHz Carrier (@+25 $^\circ\text{C}$ )	@ 1 Hz offset		-60	dB/Hz	
	@ 10 Hz offset		-88		
	@ 100 Hz offset		-109		
	@ 1 kHz offset		-132		
	@ 10 kHz offset		-149		
	@ 100 kHz offset		-150		

#### Notes:

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 Output Load section at +25 $^\circ\text{C}$
3. AC-Coupled outputs require an external capacitor,  $\geq 1$ nF recommended
4. Frequency shift  $\leq 1$ ppm after reliability test conditions (see section 8.0)



2.5 x 2.0 x 0.8mm

ASTXR-12-38.400MHz-514054-T

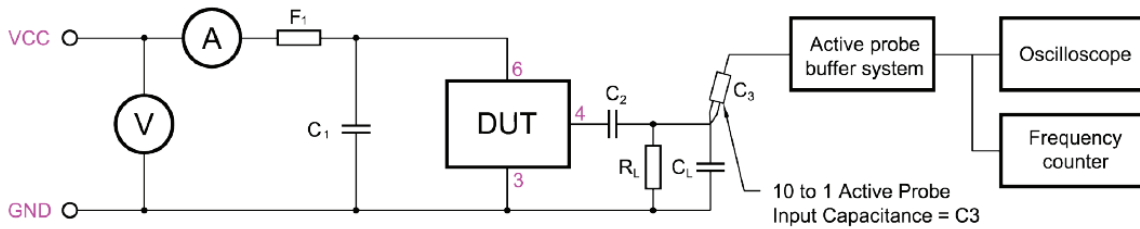
RoHS / RoHS II Compliant

## PART IDENTIFICATIONS:

ASTXR-12-38.400MHz -514054 -

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

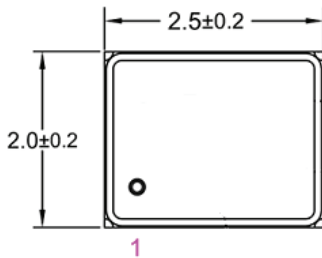
## TEST CIRCUIT:



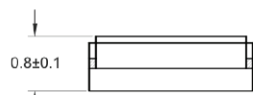
$C_1$ : 100nF  
 $C_2$ :  $\geq 1$ nF  
 $R_L$ : 10K

$C_T = C_L + C_3$  ( $C_3$  - Oscilloscope probe capacitance)  
 $C_T$  as stated in OSCILLATOR OUTPUT section  
 $F_1$ : A ferrite bead or a resistor between  $22\Omega \sim 47\Omega$  recommended.

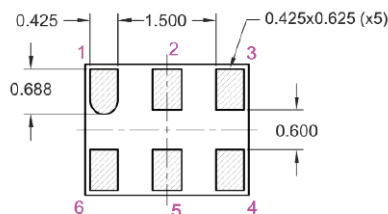
## OUTLINE DIMENSION:



TOP VIEW

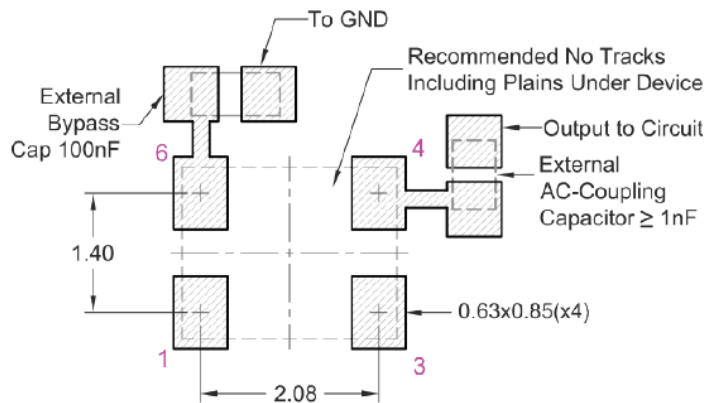


FRONT VIEW



BOTTOM VIEW

## Recommended Land Pattern

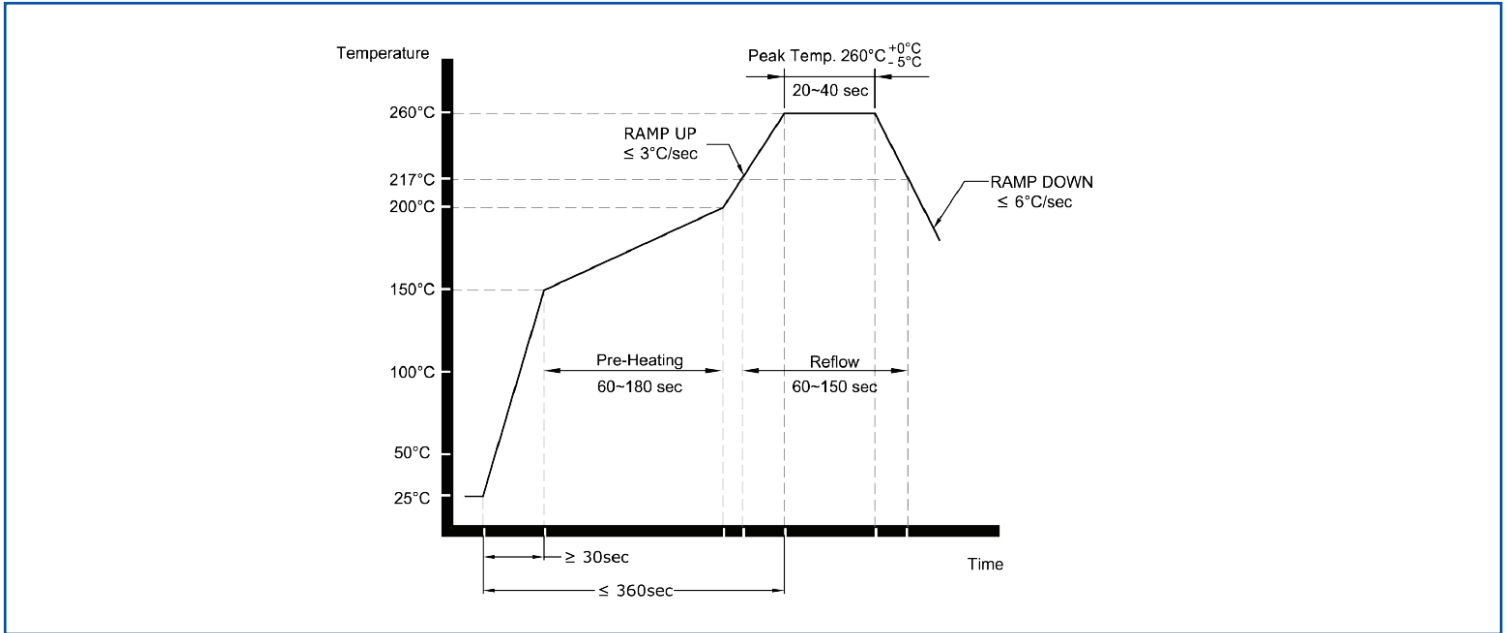


Pin	Function
1	NC/GND
2	NC/GND
3	GND
4	Output
5	NC/GND
6	Vdd

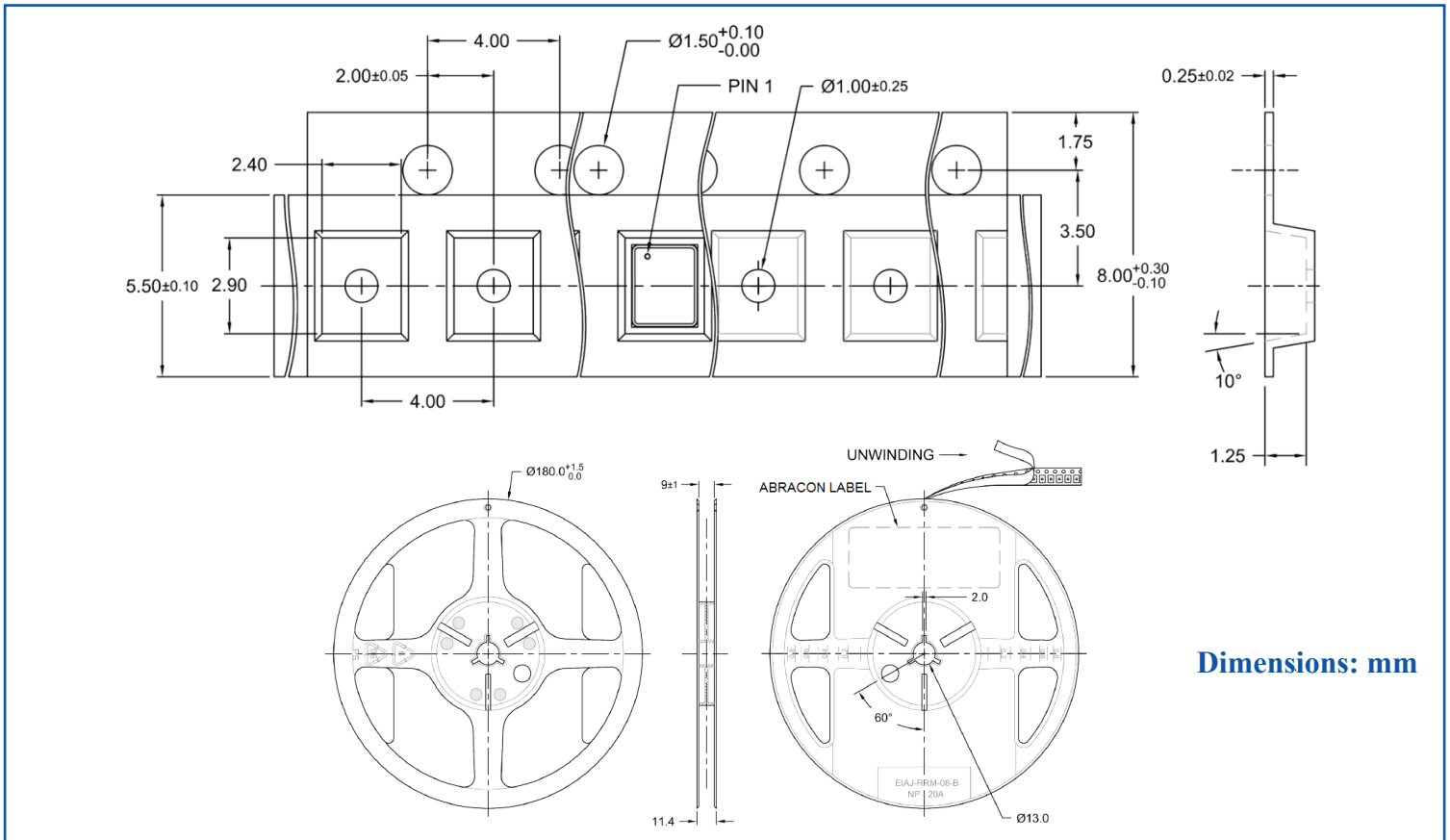
Dimensions: mm



## REFLOW PROFILE:



## TAPE & REEL:



Dimensions: mm

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