

# CONTINUOUS VOLTAGE SMD CRYSTAL OSCILLATOR

ASEDV

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ESD Sensitive

3.2 x 2.5 x 1.2mm

RoHS/RoHS II Compliant

MSL Level = N/A

## Features

- Continuous Vdd operation from 1.6 V ~ 3.6 V
- Optimized for low current consumption
- Output Enable/Start & Disable/Stop function
- Output waveform CMOS/HCMOS/LVCMOS compatible
- Hermetically seam-sealed ceramic package

## Applications

- Portable & wearable electronics
- Internet of Things (IoT)
- Consumer electronics
- Industrial control & automation
- Mobile communication

## Electrical Specifications

Parameters	Min.	Typ.	Max.	Units	Notes
Frequency Range	1		160	MHz	
Operating Temperature Range	-40		+85	°C	See options
Storage Temperature Range	-55		+125	°C	
Overall Frequency Stability <sup>[Note 1]</sup>	-25		+25	ppm	See options
Supply Voltage (Vdd)	1.6		3.6	V	
Tri-state function	“1” (VIH≥0.7*Vdd) or Open: Oscillation; “0” (VIL<0.3*Vdd): No Oscillation/Hi Z			V	
Output Load			15	pF	CMOS
Output Voltage	V <sub>OH</sub>	0.9*Vdd		V	
	V <sub>OL</sub>		0.1*Vdd		
Aging 1 year @25°C± 3°C	-3.0		+3.0	ppm	
Aging 5 years @25°C± 3°C	-5.0		+5.0	ppm	
Symmetry @ ½ Vdd	45	50	55	%	
Start-up Time			10.0	ms	
Rise and Fall Time (Tr/Tf) @10%Vdd-90%Vdd, 15pF load	Vdd = 1.8V to 3.6V		8.0	ns	1MHz ≤ F ≤ 19.999MHz
			6.0		20MHz ≤ F ≤ 39.999MHz
			5.0		40MHz ≤ F ≤ 69.999MHz
			5.0		70MHz ≤ F ≤ 99.999MHz
			4.0		100MHz ≤ F ≤ 129.999MHz
			3.0		130MHz ≤ F ≤ 160MHz
	Vdd = 1.6V		10.0		1MHz ≤ F ≤ 19.999MHz
			8.0		20MHz ≤ F ≤ 39.999MHz
			6.0		40MHz ≤ F ≤ 69.999MHz
			6.0		70MHz ≤ F ≤ 99.999MHz
			5.0		100MHz ≤ F ≤ 129.999MHz
			5.0		130MHz ≤ F ≤ 160MHz
			5.0		
			5.0		
RMS Period Jitter @25°C± 3°C	Vdd = 3.0V to 3.6V		5.0	ps	
	Vdd = 1.6V to 2.5V		7.0		
RMS Phase Jitter @25°C± 3°C (10 - 39MHz: 12kHz to 5MHz) (>39MHz: 12kHz to 20MHz)			< 1.0	ps	
Disable Current			10.0	µA	

\*Note 1: Overall frequency stability includes initial frequency tolerance @25°C± 3°C and stability over the operating temperature range.



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## Electrical Specifications *continued*

Parameters	Min.	Typ.	Max.	Units	Notes
Supply Current (I <sub>dd</sub> ) into 15pF Load @25°C± 3°C @ V <sub>dd</sub> =3.3V			2.0	mA	1MHz ≤ F < 5.999MHz
			2.0		6MHz ≤ F < 9.999MHz
			3.0		10MHz ≤ F < 19.999MHz
			4.0		20MHz ≤ F < 29.999MHz
			5.0		30MHz ≤ F < 39.999MHz
			5.0		40MHz ≤ F < 45.999MHz
			5.0		46MHz ≤ F < 48.999MHz
			6.0		49MHz ≤ F < 50.999MHz
			8.0		51MHz ≤ F < 54.999MHz
			8.0		55MHz ≤ F < 60.999MHz
			12.5		61MHz ≤ F < 75.999MHz
			14.5		76MHz ≤ F < 80.999MHz
			14.5		81MHz ≤ F < 105.999MHz
			15.5		106MHz ≤ F < 119.999MHz
			15.5		120MHz ≤ F < 130.999MHz
		18.0	131MHz ≤ F < 139.999MHz		
		18.0	140MHz ≤ F < 149.999MHz		
		18.0	150MHz ≤ F < 156.999MHz		
		19.0	157MHz ≤ F < 160MHz		
Supply Current (I <sub>dd</sub> ) into 15pF Load @25°C± 3°C @ V <sub>dd</sub> =2.5V			1.3	mA	1MHz ≤ F < 5.999MHz
			1.3		6MHz ≤ F < 9.999MHz
			2.0		10MHz ≤ F < 19.999MHz
			3.0		20MHz ≤ F < 29.999MHz
			3.5		30MHz ≤ F < 39.999MHz
			4.5		40MHz ≤ F < 45.999MHz
			4.5		46MHz ≤ F < 48.999MHz
			5.0		49MHz ≤ F < 50.999MHz
			6.5		51MHz ≤ F < 54.999MHz
			7.0		55MHz ≤ F < 60.999MHz
			10.0		61MHz ≤ F < 75.999MHz
			11.5		76MHz ≤ F < 80.999MHz
			11.5		81MHz ≤ F < 105.999MHz
			12.5		106MHz ≤ F < 119.999MHz
			12.5		120MHz ≤ F < 130.999MHz
		14.0	131MHz ≤ F < 139.999MHz		
		14.0	140MHz ≤ F < 149.999MHz		
		14.0	150MHz ≤ F < 156.999MHz		
		15.0	157MHz ≤ F < 160MHz		
Supply Current (I <sub>dd</sub> ) into 15pF Load @25°C± 3°C @ V <sub>dd</sub> =1.8V			1.0	mA	1MHz ≤ F < 5.999MHz
			1.0		6MHz ≤ F < 9.999MHz
			1.6		10MHz ≤ F < 19.999MHz
			2.2		20MHz ≤ F < 29.999MHz
			2.5		30MHz ≤ F < 39.999MHz
			3.0		40MHz ≤ F < 45.999MHz
			3.5		46MHz ≤ F < 48.999MHz
			3.5		49MHz ≤ F < 50.999MHz
			3.5		51MHz ≤ F < 54.999MHz
			4.0		55MHz ≤ F < 60.999MHz
			9.0		61MHz ≤ F < 75.999MHz
			9.0		76MHz ≤ F < 80.999MHz
			10.0		81MHz ≤ F < 105.999MHz
			10.0		106MHz ≤ F < 119.999MHz
			10.5		120MHz ≤ F < 130.999MHz
		10.5	131MHz ≤ F < 139.999MHz		
		11.5	140MHz ≤ F < 149.999MHz		
		11.5	150MHz ≤ F < 156.999MHz		
		11.5	157MHz ≤ F < 160MHz		



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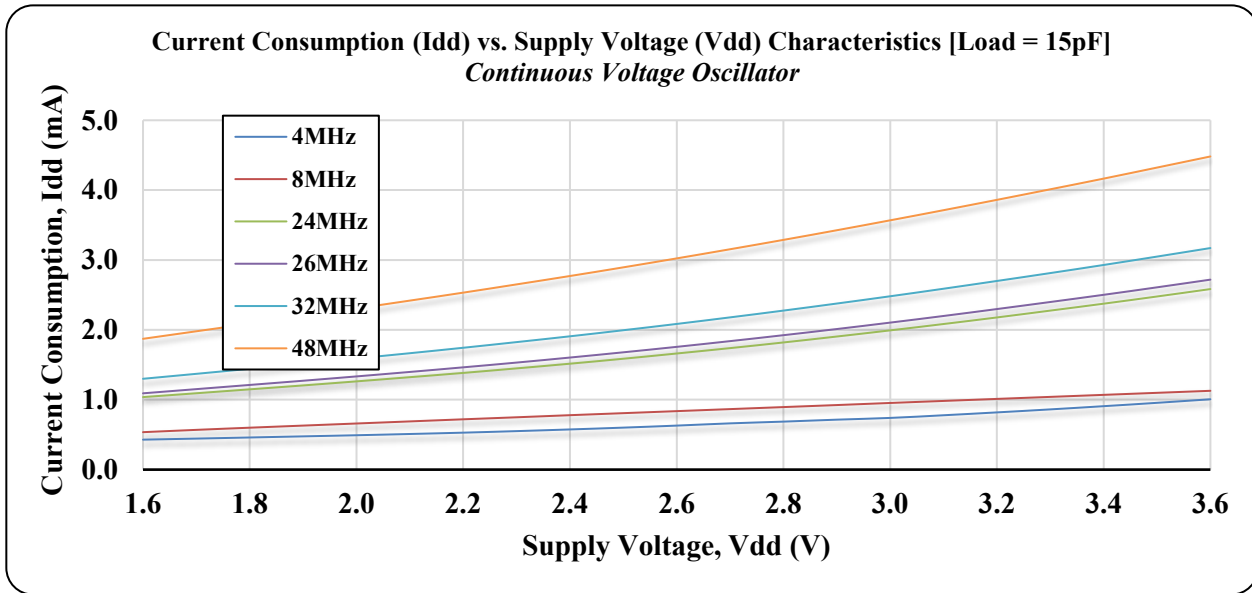
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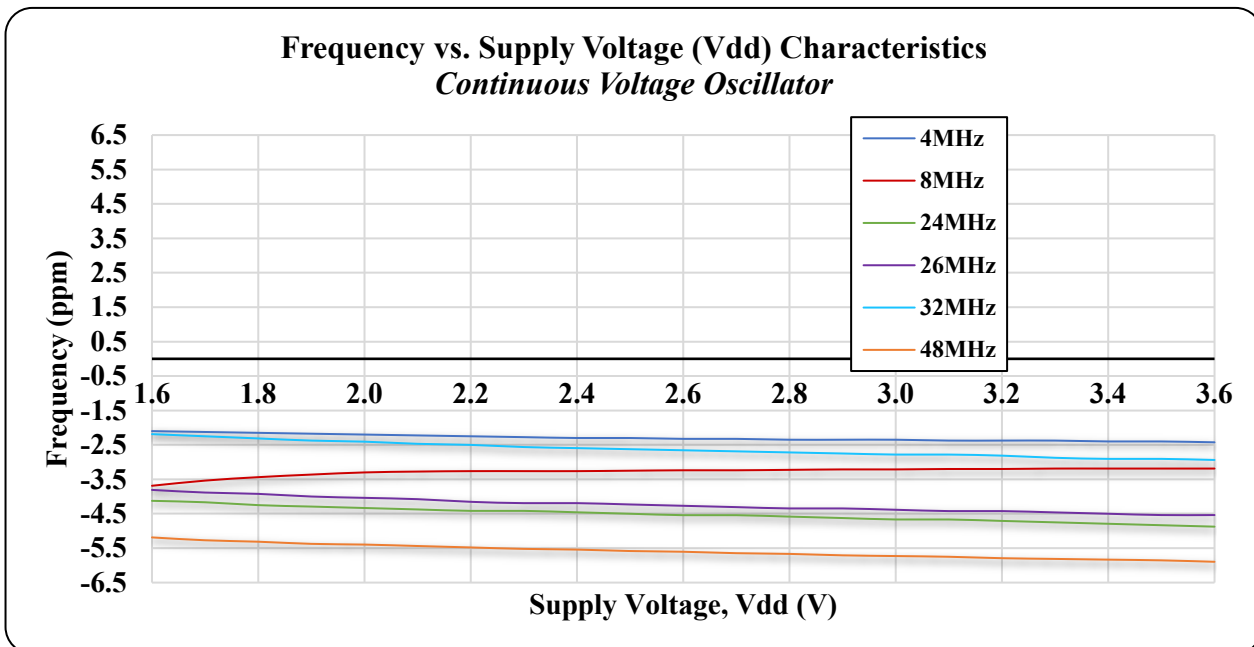
ESD Sensitive

3.2 x 2.5 x 1.2mm  
RoHS/RoHS II Compliant  
MSL Level = N/A

## Typical Current Consumption (I<sub>dd</sub>) vs. Supply Voltage (V<sub>dd</sub>) Characteristics @25°C±3°C [Load = 15pF]



## Typical Frequency vs. Supply Voltage (V<sub>dd</sub>) Characteristics @ 25°C±3°C



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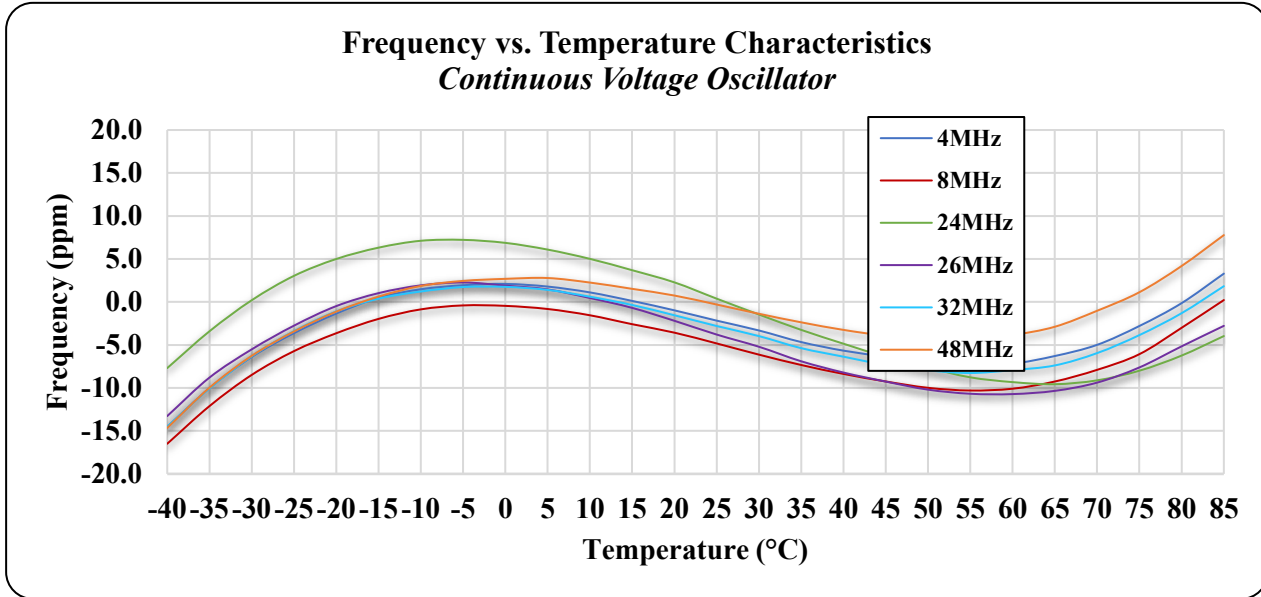
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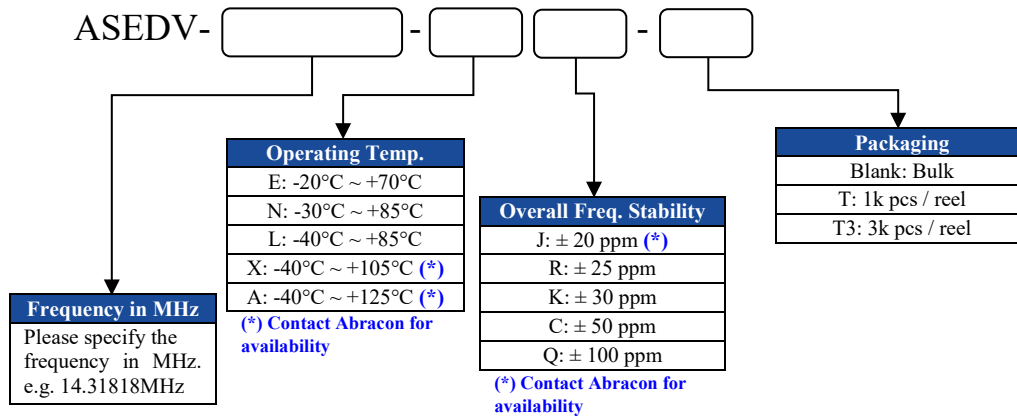
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## Typical Frequency vs. Temperature Characteristics




## Part Identification



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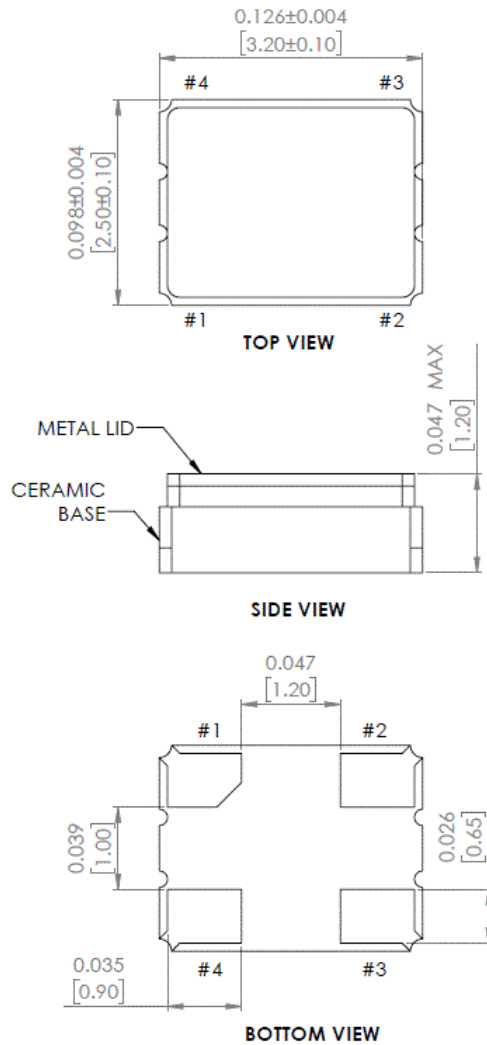
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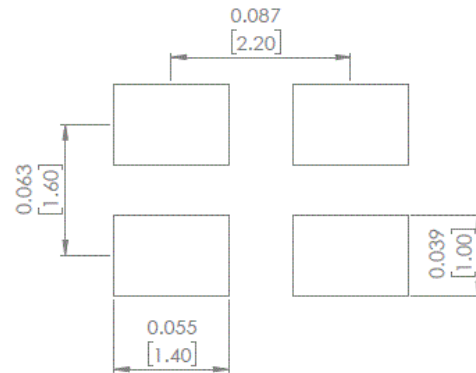


3.2 x 2.5 x 1.2mm  
 RoHS/RoHS II Compliant  
 MSL Level = N/A

## Mechanical Dimensions



### Recommended Land Pattern



Pin #	Function
1	Tri-State
2	GND
3	Output
4	Vdd

Note: Recommended to use approximately 0.01µF bypass capacitor between PIN 2 and PIN 4

Dimensions: inches (mm)




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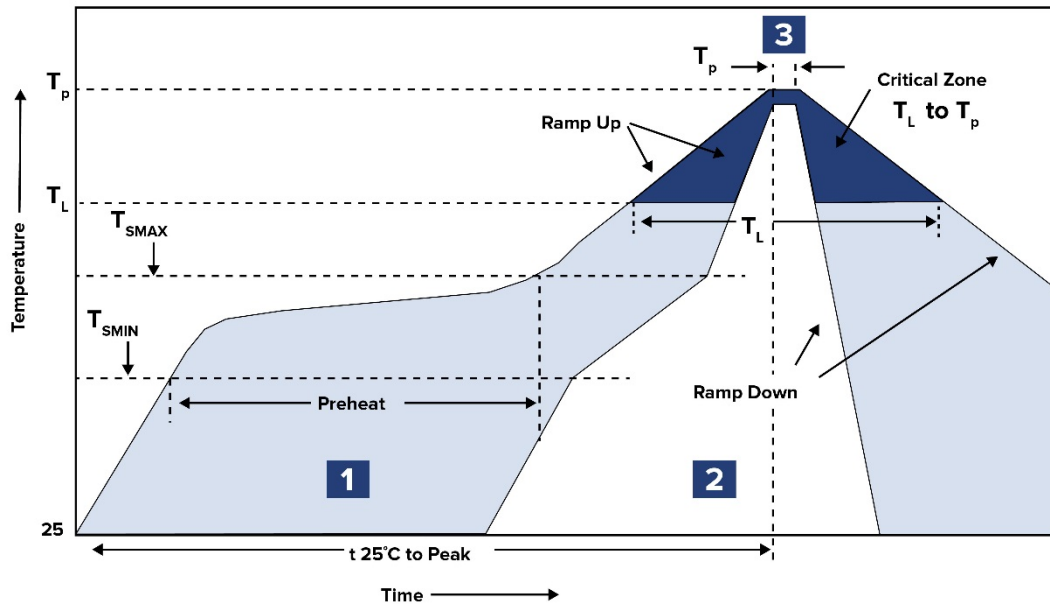
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## Reflow Profile



Zone	Description	Temperature	Time
1	Preheat	$T_{SMIN} \sim T_{SMAX}$ 150°C ~ 200°C	60 ~ 120 sec.
2	Reflow	$T_L$ 217°C	60 ~ 150 sec.
3	Peak heat	$T_P$ 250°C ~ 260°C	30 sec. MAX

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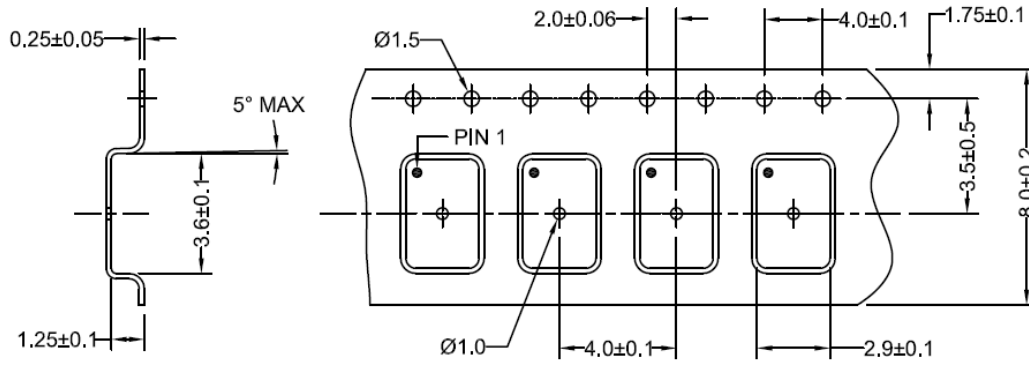
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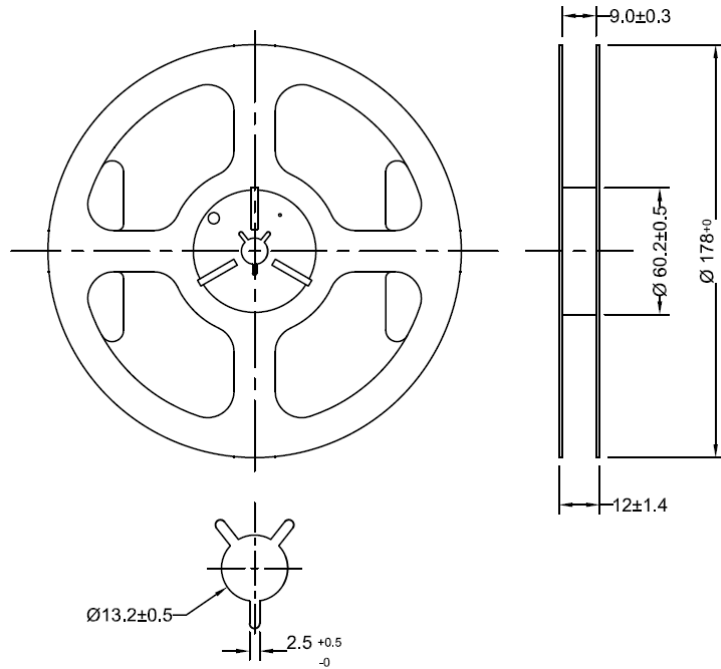
## Packaging

T: 1,000pcs/reel

T3: 3,000pcs/reel



FEEDING (PULL) DIRECTION



Dimensions: inches (mm)

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