

# CONTINUOUS VOLTAGE SMD TCXO

ATX-H13

Request Samples



Check Inventory



ESD Sensitive



2.0 x 1.6 x 0.8 mm  
RoHS/RoHS II Compliant  
MSL Level = 1

## Features

- Both continuous & fixed Vdd options available
- Output waveform CMOS
- Hermetically seam-sealed ceramic package
- Low current consumption

## Applications

- Cellular and cordless phones
- Standard oscillator for exact equipment
- Consumer electronics
- Industrial control & automation
- Mobile communication

## Electrical Specifications <sup>[Note 1]</sup>

Parameters	Min.	Typ.	Max.	Units	Notes
Frequency Range	9.6		60	MHz	
Operating Temperature	-40		+105	°C	See Options (Table 1)
Storage Temperature	-40		+125	°C	
<b>Frequency Stability <math>\Delta f/f_0</math> vs:</b>					
<i>Tolerance</i>	-1.0		+1.0	ppm	Reference to $f_0$ , at 25°C±2°C, Pre-reflow
<i>Tolerance</i>	-2.0		+2.0		Reference to $f_0$ , at 25°C ±2°C, 24 hours after reflow, two times
<i>Temperature</i>	-2.5		+2.5		See Options (Table 1)
<i>Supply Voltage Change</i>	-0.2		+0.2		Reference to $f_0$ , at 25°C ±2°C
<i>Load Change</i>	-0.2		+0.2		Vdd ± 5%
Aging	-1.0		+1.0		First year @+25°C±2°C
Supply Voltage (Vdd)	+3.135	+3.3	+3.465	V	Option E
	+2.85	+3.0	+3.15		Option A
	+2.66	+2.8	+2.94		Option B
	+2.375	+2.5	+2.625		Option C
	+1.71	+1.8	+1.89		Option D
	+1.68		+3.63		Option F
Supply Current (Idd)			4.8	mA	9.60MHz to 20.00MHz
			5.5		20.01MHz to 30.00MHz
			6.0		30.01MHz to 40.00MHz
			7.0		40.01MHz to 50.00MHz
			8.0		50.01MHz to 60.00MHz
Start-up Time			10	ms	
Rise and Fall Time (Tr/Tf) @10%Vdd-90%Vdd, 15pF load			5	ns	
Symmetry @ ½ Vdd	45	50	55	%	
Output Voltage	V <sub>OH</sub>	90%Vdd		V	
	V <sub>OL</sub>		10%Vdd		
Output Load			15	pF	CMOS
Output Waveform	CMOS				
Tri-state function <sup>[Note 2]</sup>	“1” (VIH≥0.7*Vdd) or Open: Oscillation; “0” (VIL<0.3*Vdd): No Oscillation/Hi Z			V	

**Note 1:** All measurements made at 25°C ±2°C, nominal Vdd, unless otherwise specified

**Note 2:** Do not leave pin 1 ( $\overline{\text{INH}}$ ) floating. If pin 1 ( $\overline{\text{INH}}$ ) is not utilized for toggling, it must be tied to Vdd (logic 1).

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## Electrical Specifications continued

Parameters	Min.	Typ.	Max.	Units	Notes
<b>Phase Noise (@ 10 MHz Carrier, @ 25°C ±2°C)</b>					
@10Hz offset		-98	-94	dBc/Hz	Applicable to all standard available frequencies with Vdd = +1.8V, +2.5, +2.8, +3.0V, +3.3V
@100Hz offset		-122	-118		
@1kHz offset		-145	-141		
@10kHz offset		-152	-149		
@100kHz offset		-154	-151		
@1MHz offset		-154	-151		
@5MHz offset		-155	-152		
<b>Phase Noise (@ 52 MHz Carrier, @ 25°C ±2°C)</b>					
@10Hz offset		-83	-79	dBc/Hz	Applicable to all standard available frequencies with Vdd = +1.8V, +2.5, +2.8, +3.0V, +3.3V
@100Hz offset		-106	-102		
@1kHz offset		-127	-123		
@10kHz offset		-147	-144		
@100kHz offset		-154	-151		
@1MHz offset		-155	-152		
@10MHz offset		-155	-152		
@20MHz offset		-155	-152		

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## Part Identification

ATX-H13-- MHz--

Vdd (V)
A: 3.0V±5%
B: 2.8V±5%
C: 2.5V±5%
D: 1.8V±5%
E: 3.3V±5%
F: +1.68V ~ +3.63V

Frequency in MHz
Please specify the frequency in MHz. e.g. 26.000MHz

Packaging
Blank: Bulk
T: 1000pcs/reel
T3: 3000pcs/reel

**Table 1: Frequency Stability vs Operating Temperature**

OTR	±2.5ppm	±3.0ppm	±4.0ppm	±5.0ppm	±10.0ppm
0°C ~ +70°C	A25	A30	A40	A50	A100
-10°C ~ +60°C	B25	B30	B40	B50	B100
-20°C ~ +70°C	C25	C30	C40	C50	C100
-30°C ~ +75°C	D25	D30	D40	D50	D100
-30°C ~ +85°C	E25	E30	E40	E50	E100
-40°C ~ +85°C	F25	F30	F40	F50	F100
-40°C ~ +105°C	-	-	-	G50	G100

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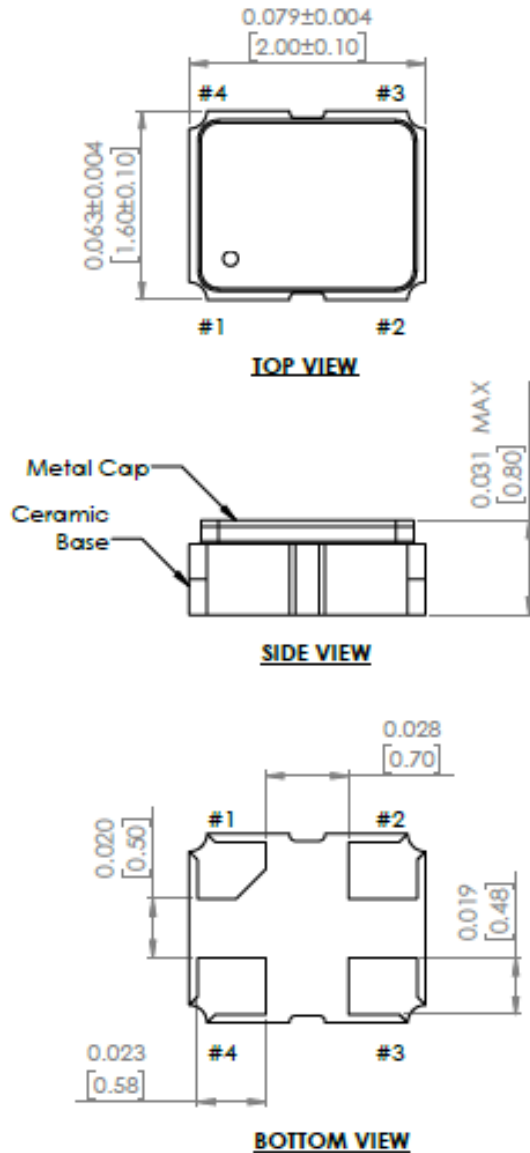


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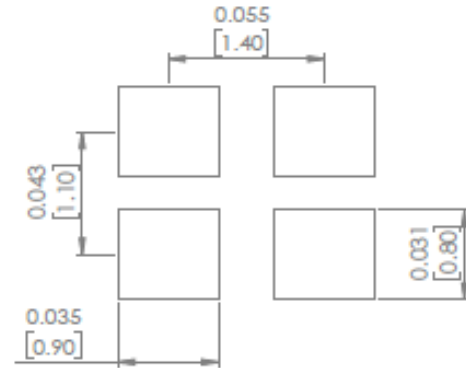


2.0 x 1.6 x 0.8 mm  
RoHS/RoHS II Compliant  
MSL Level = 1

## Mechanical Dimensions



## Recommended Land Pattern



Pin #	Function
1	INH
2	GND
3	Output
4	Vdd

INH Function	
#1	#3 (Output)
Open	Active
"H" Level	Active
"L" Level	High Z (No Oscillation)

### Note 3:

- Do not leave Pin 1 ( $\overline{\text{INH}}$ ) floating
- If Pin 1 ( $\overline{\text{INH}}$ ) is not utilized for toggling, it must be tied to Vdd (logic 1)

### Note 4:

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

Dimensions: inches (mm)

Reflow Profile [JDEC J-STD-020]



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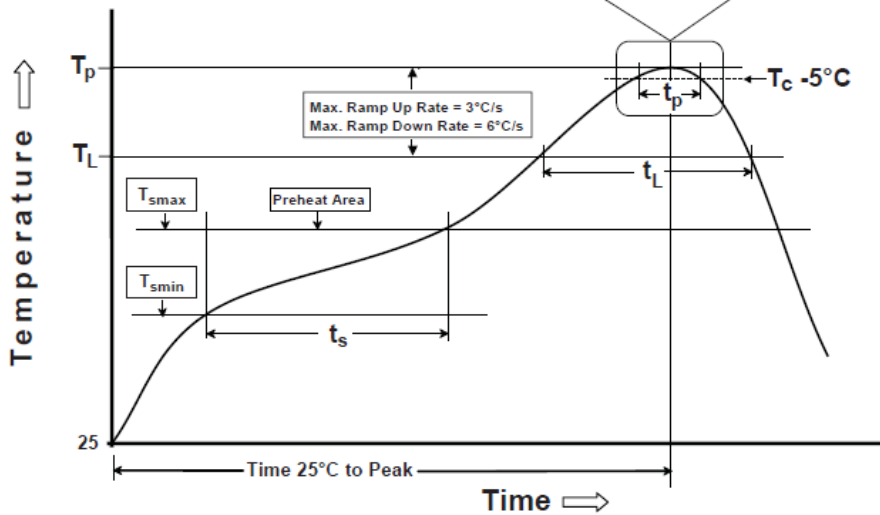
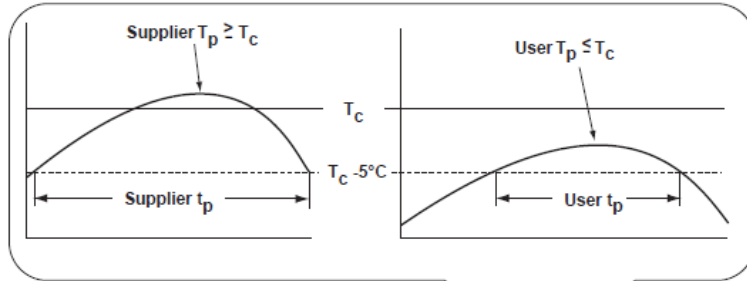


Table 1

SnPb Eutectic Process  
Classification Temperatures ( $T_c$ )

Package Thickness	Volume mm <sup>3</sup> <350	Volume mm <sup>3</sup> ≥350
<2.5 mm	235 °C	220 °C
≥2.5 mm	220 °C	220 °C

Table 2

Pb-Free Process  
Classification Temperatures ( $T_c$ )

Package Thickness	Volume mm <sup>3</sup> <350	Volume mm <sup>3</sup> 350-2000	Volume mm <sup>3</sup> >2000
<1.6 mm	260 °C	260 °C	260 °C
1.6 mm - 2.5 mm	260 °C	250 °C	245 °C
>2.5 mm	250 °C	245 °C	245 °C

Profile Feature	Sn-Pb Eutectic Assembly	Pb-Free Assembly
Preheat / soak		
Temperature minimum ( $T_{smin}$ )	100°C	150°C
Temperature maximum ( $T_{smax}$ )	150°C	200°C
Time ( $T_{smin}$ to $T_{smax}$ ) ( $t_s$ )	60 - 120 sec.	60 - 120 sec.
Average ramp-up rate ( $T_{smax}$ to $T_p$ )	3°C/sec. max	3°C/sec. max
Liquidous temperature ( $T_L$ )	183°C	217°C
Time at liquidous ( $t_L$ )	60 - 150 sec.	60 - 150 sec.
Peak package body temperature ( $T_p$ )*	see Table 1	see Table 2
Time ( $t_p$ )** within 5°C of the specified classification temperature ( $T_c$ )	20 sec.	30 sec.
Ramp-down rate ( $T_p$ to $T_{smax}$ )	6°C/sec. max	6°C/sec. max
Time 25°C to peak temperature	6 min. max	8 min. max

\*Tolerance for peak profile temperature ( $T_p$ ) is defined as a supplier minimum and a user maximum.

\*\*Tolerance for time at peak profile temperature ( $t_p$ ) is defined as a supplier minimum and a user maximum.

## Packaging



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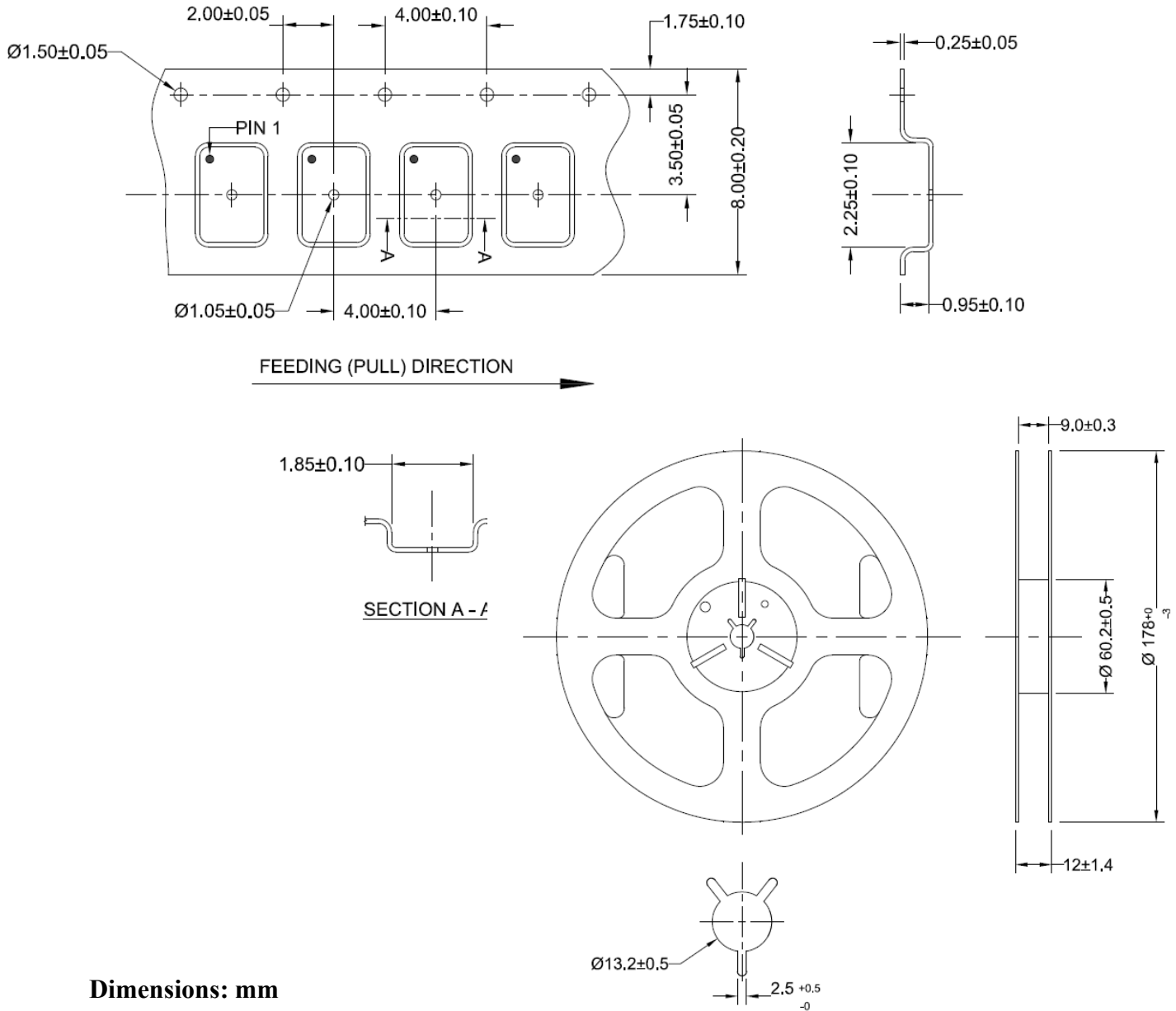
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**2.0 x 1.6 x 0.8 mm**  
**RoHS/RoHS II Compliant**  
**MSL Level = 1**

**T: 1,000pcs/reel**

**T3: 3,000pcs/reel**



**Dimensions: mm**

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