Precision SMD VCTCXO/TCXO

AST3TDA

Request Samples > Check Inventory >

ESD Sensitive Pb

7.0 x 5.0 x 2.2 mm
RoHS/RoHS II Compliant
MSL Level = 3

Features

- Wide operating temperature range with high stability options: -40ºC to +105ºC @ ±50ppb, ±100ppb and ±280ppb
- Standard available frequencies: 10, 12.8, 16.384, 18.432, 19.2, 19.44, 20, 30.72, 38.88, 40, 50MHz
- CMOS or Clipped Sine Wave output
- Voltage-control option available

Applications

- Stratum 3
- Network routers and switches
- COTS Military Radios & other Communication Hardware
- Wireless Communication
- GPS Tracking with Hold-Over Accuracy
- Test & Measurement Equipment
- Autonomous Technologies

Maximum Ratings

Parameters	Notes
Storage Temperature Range	-55 to +105°C
Supply Voltage	-0.5 to 6V
Control Voltage	0 to 3.3V
ESD, HBM/CDM/MM	4kV/2kV/200V/400V

Electrical Specifications

Parameters	Min.	Typ.	Max.	Units	Notes
Frequency Range	10		50	MHz	
Standard Frequencies	10, 12.8, 15, 16.384, 18.432, 19.2, 19.44, 20, 30.72, 38.88, 40, 50			MHz	
Operating Temperature Range	-40		+105	°C	*See options*
Initial Frequency Tolerance at shipping	-1		+1	ppm	@ T_A = 25°C, V_{cc}= 3.3V, V_c=1.65V within 30 days after ex-works
Frequency Stability over Operating Temperature Range [Note 1]	-100		+100	ppb	*See options*
Frequency Stability vs. Supply Voltage Change (Vdd±5%)	-50		+50	ppb	@ T_A=25°C, V_{cc} varied from 3.13V to 3.47V, V_c=1.65V
Frequency Stability vs. Load Change (Load±5%)	-50		+50	ppb	5% load change @ T_A= 25°C, V_{cc}=3.3V, V_c=1.65V, O_{Load}= 15pF
Short Term Stability			200	ppb	after power for 1hour ref. to 25°C
Aging (first year)	-1		+1	ppm	T_A=25°C, V_{cc}=3.3V, after 1h of operation
Aging (20 years @+25°C)	-3		+3	ppm	
Supply Voltage (Vdd)	3.13	3.3	3.47	V	*See options*
Supply Current (Icc)			10	mA	25°C, V_{cc}=3.3V, O_{Load}= 15pF
Start-up Time			5	ms	
Control Port (*Applicable for VCTCXO only*)					
Control Voltage Range (Vc)	0		3.3	V	
Center Control Voltage (Vc)		1.65		V	
Frequency Tuning Range (Carrier Frequency <=20MHz)			-8	ppm	V_c=0V, referenced to V_c=1.65V
	-1		+1	ppm	V_c=1.65V, referenced to carrier frequency
	+8			ppm	V_c=3.3V, referenced to V_c=1.65V
Frequency Tuning Range (Carrier Frequency >20MHz)			-5	ppm	V_c=0V, referenced to V_c=1.65V
	-1		+1	ppm	V_c=1.65V, referenced to carrier frequency
	+5			ppm	V_c=3.3V, referenced to V_c=1.65V

Note 1: T_A varied from -40°C to 105°C, measurement referenced to frequency observed with f_{ref}=(f_{max}+f_{min})/2, V_{cc}= 3.3V, V_c=1.65V, temperature variable speed less than 2°C/min.

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Electrical Specifications *continued*

Parameters	Min.	Typ.	Max.	Units	Notes
Tuning Slope		Positive			
Linearity			10	%	
Port Impedance	100			kΩ	
Phase Noise (@25°C):		-85	-80	dBc/Hz	Offset @10Hz
		-115	-110		Offset @100Hz
		-140	-135		Offset @1kHz
		-150	-145		Offset @10kHz
		-152	-148		Offset @100kHz
		-155	-150		Offset @1MHz
Clipped Sine Wave Output					
Output Level	0.8			Vp-p	
Output Load		10kΩ//10pF			
CMOS (Square Wave) Output					
V_{OH}	2.4			V	V_{cc}=3.3V, O_{load}=15 pF
V_{OL}			0.4	V	V_{cc}=3.3V, O_{load}=15 pF
Output Load		15		pF	
Duty Cycle	45	50	55	%	@50%
Rise / Fall Time (10%~90%)			8	ns	@25°C

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Part Identification
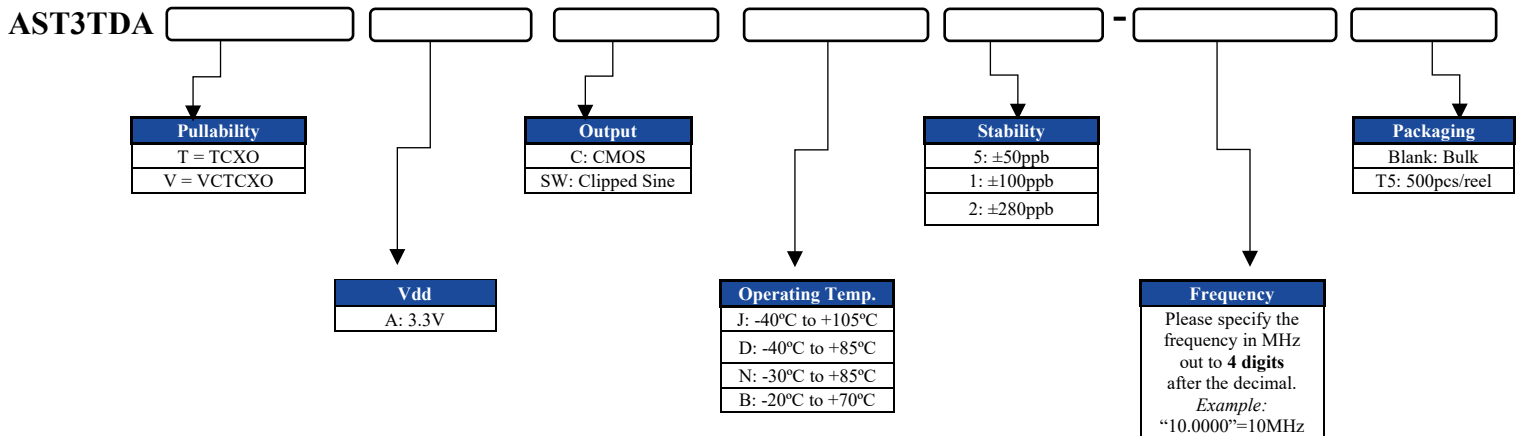
AST3TDA ☐ ☐ ☐ ☐ ☐ - ☐ ☐

Pullability
T = TCXO
V = VCTCXO

Vdd
A: 3.3V

Output
C: CMOS
SW: Clipped Sine

Operating Temp.
J: -40ºC to +105ºC
D: -40ºC to +85ºC
N: -30ºC to +85ºC
B: -20ºC to +70ºC

Stability
5: ±50ppb
1: ±100ppb
2: ±280ppb

Frequency
Please specify the frequency in MHz out to **4 digits** after the decimal.
Example:
"10.0000"=10MHz

Packaging
Blank: Bulk
T5: 500pcs/reel

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Mechanical Dimensions

TOP VIEW

0.276 [7.00]
0.197 [5.00]
PIN 1

SIDE VIEW

0.028 MAX [0.70]
0.087 [2.20]
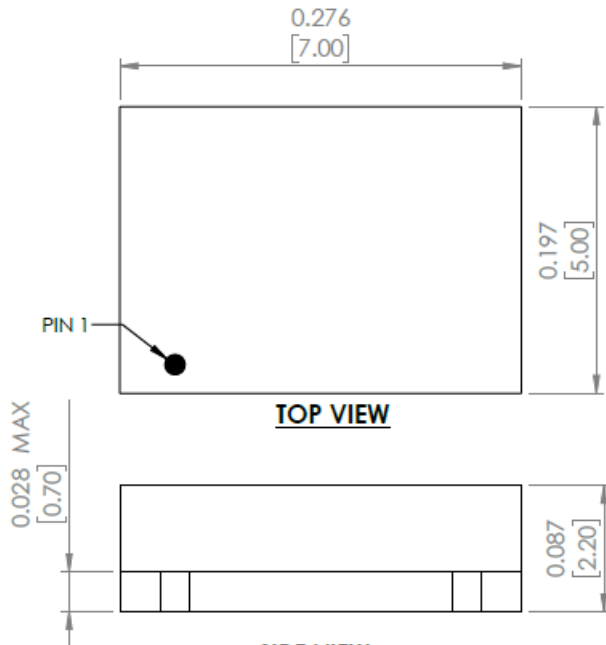
Recommended Land Pattern

0.200 [5.08]
0.165 [4.20]
0.047 [1.20]
0.059 [1.50]

BOTTOM VIEW

0.012 X 45° [0.30]
0.200 [5.08]
0.031 [0.80]
0.118 [3.00]
#1 #2 #4 #3
0.055 [1.40]
0.031 [0.80]
0.039 [1.00]

Pin #	Function
1	Do not connect (for TCXO)
	Voltage control (for VCTCXO)
2	GND
3	Output
4	Vdd
*	Do not connect
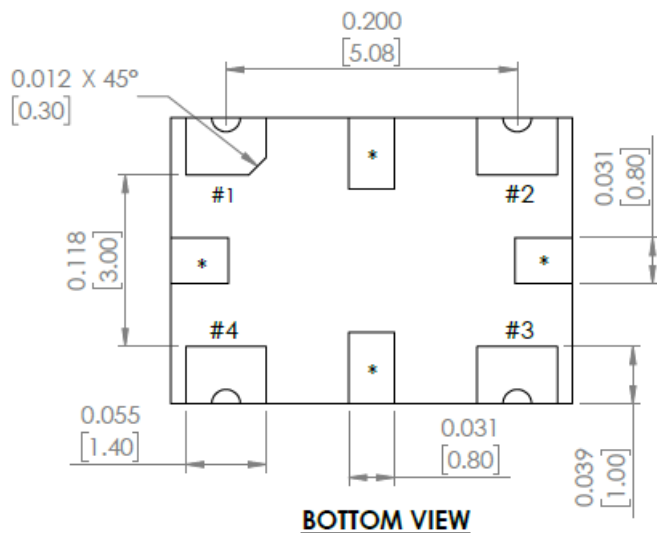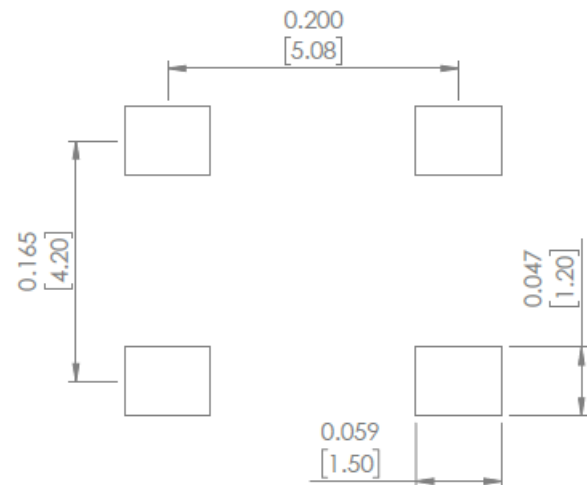
Dimensions: inches [mm]
Tolerance ±0.2mm

ABRACON

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REVISED: 06-15-21

ABRACON IS
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CERTIFIED

Precision SMD VCTCXO/TCXO
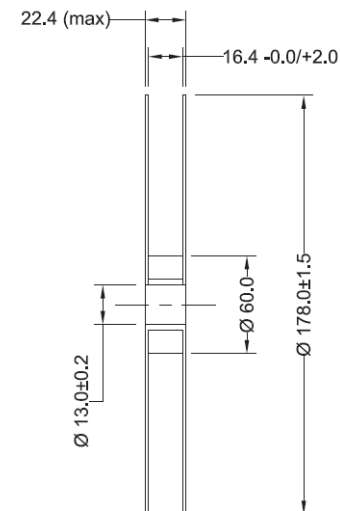
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Reflow Profile [JEDEC J-STD-020]
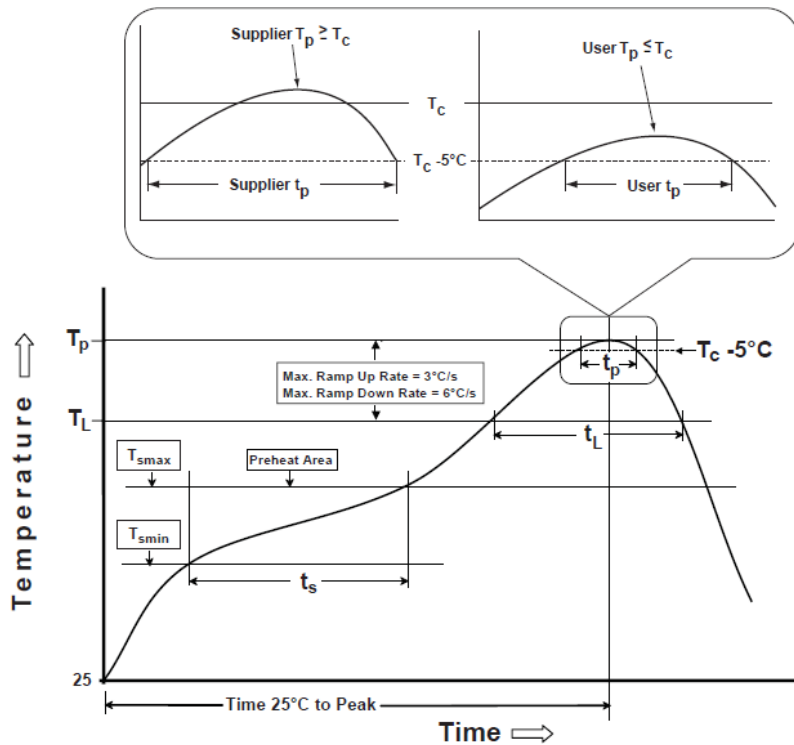
Table 1

SnPb Eutectic Process Classification Temperatures (T_c)		
Package Thickness	Volume mm³ <350	Volume mm³ ≥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 mm³ <350	Volume mm³ 350-2000	Volume mm³ >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
Reflow cycles	2 max	2 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 supplier minimum and a user maximum.

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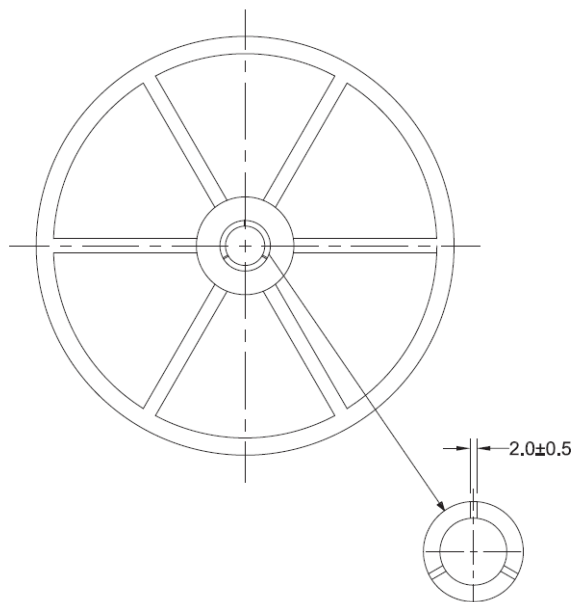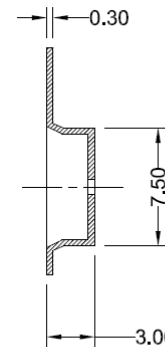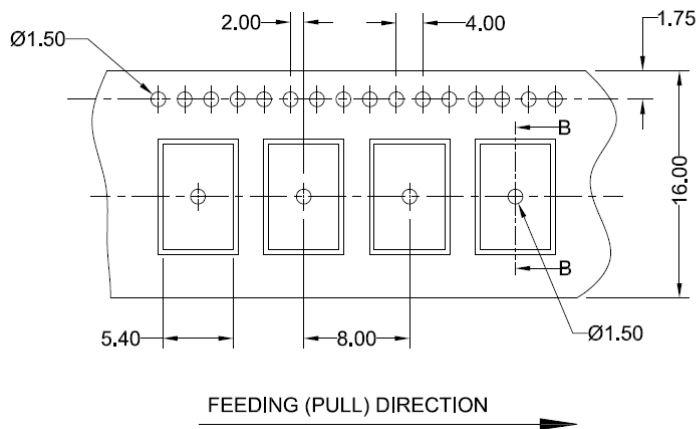**ESD Sensitive**   Pb

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MSL Level = 3

Packaging

T5: 500pcs/reel

FEEDING (PULL) DIRECTION

SECTION B - B

Dimensions: mm