AVTX -14
SMD VCTCXO

Description

With output frequencies in the range of 9.5Mhz to 52MHz, the Abracon AVTX-14 series is offered in a small compact package, perfect for reducing board space. The series comes with several supply voltage range options spanning from 1.8 V, 2.5 V, 2.8V, 3.0 V, and 3.3 V. In addition, the AVTX-14 provides a clipped sinewave output that can maintain a frequency stability of ±0.5 ppm at -40°C ~ +85°C.



Features

- Output waveform clipped sinewave
- Hermetically seam-sealed ceramic package
- Low current consumption
- REACH/RoHS II Compliant | MSL Level 1
- ESD Sensitive

Typical Applications

- Wireless communication
- Test and measurement equipment
- Industrial control and automation
- GPS receivers

Electrical Specifications

Parameters	Min.	Typ.	Max.	Units	Notes
Frequency Range	9.5		52	MHz	
Standard Frequencies	10, 32, 40, 52			MHz	
Operating Temperature	-40		+85	°C	See options (Table 1)
Storage Temperature	-40		+85	°C	
Frequency Stability Δf/f₀ vs:					
Tolerance	-1.0		+1.0	ppm	Reference to f_o, at 25°C±2°C, Pre-reflow
Tolerance	-2.0		+2.0		Reference to f_o, at 25°C±2°C, 24 hours after reflow, two times
Temperature	-2.5		+2.5		See Options (Table 1) Reference to f_o, at 25°C±2°C
Supply Voltage Change	-0.2		+0.2		Vdd ± 5%
Load Change	-0.2		+0.2		CL ± 1kΩ//±1pF
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
Supply Current (Idd)			2.0	mA	9.50MHz to 26.00 MHz
			2.5		26.01MHz to 52.00 MHz
Start-up Time			2.0	ms	
Output Voltage	0.8			Vp-p	
Output Load	9	10	11	kΩ	
	9	10	11	pF	
Output Waveform	Clipped Sine Wave, External DC-Cut Capacitor Required				1000 pF recommended
Voltage Control Function (Vcon)	0.4	1.4	2.4	Vdc	Vdd = 3.3 Vdc
	0.4	1.4	2.4	Vdc	Vdd = 3.0 Vdc
	0.4	1.4	2.4	Vdc	Vdd = 2.8 Vdc
	0.4	1.4	2.4	Vdc	Vdd = 2.5 Vdc
	0.0	0.9	1.8	Vdc	Vdd = 1.8 Vdc

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Electrical Specifications Continued

Parameters	Min.	Typ.	Max.	Units	Notes
Frequency Tuning Range			-5.0	ppm	At Vcon(min), V_{DD}=1.8Vdc
	5.0			ppm	At Vcon(max), V_{DD}=1.8Vdc
			-15.0	ppm	At Vcon(min), V_{DD}>1.8Vdc
	15.0			ppm	At Vcon(max), V_{DD}>1.8Vdc
Frequency Tuning Transition	Positive Transfer Characteristics				
Phase Noise (@ 10 MHz Carrier, @ 25°C ±2°C)					
@10Hz offset		-95	-92	dBc/Hz	Applicable to all standard available frequencies with Vdd = +1.8V, +2.5, +2.8, +3.0V, +3.3V
@100Hz offset		-120	-117		
@1kHz offset		-138	-134		
@10kHz offset		-149	-146		
@100kHz offset		-158	-155		
@1MHz offset		-159	-156		
@5MHz offset		-159	-156		
Phase Noise (@ 52 MHz Carrier, @ 25°C ±2°C)					
@10Hz offset		-79	-73	dBc/Hz	Applicable to all standard available frequencies with Vdd = +1.8V, +2.5, +2.8, +3.0V, +3.3V
@100Hz offset		-106	-101		
@1kHz offset		-132	-128		
@10kHz offset		-149	-146		
@100kHz offset		-156	-153		
@1MHz offset		-157	-154		
@10MHz offset		-157	-154		
@20MHz offset		-158	-155		

Note 1:

All measurements made at 25°C± 2°C, nominal Vdd, nominal Vcon, unless otherwise specified.

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Part Identification

AVTX-14- ☐ - ☐ MHz - ☐ - ☐

Frequency in MHz
Please specify the frequency in MHz. e.g. 9.500MHz or 26.000MHz

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

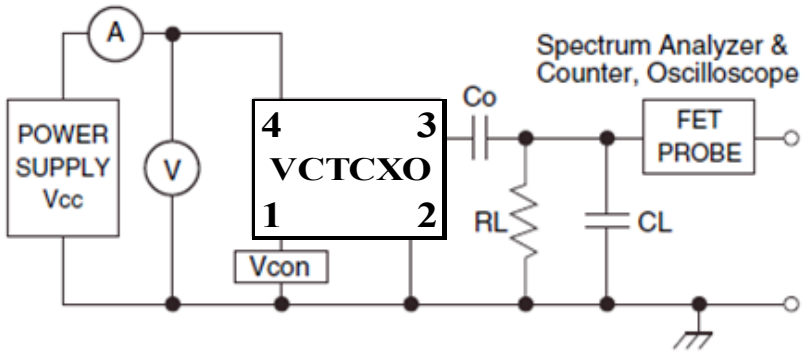
Vdd (V)
A: 3.0V± 5%
B: 2.8V± 5%
C: 2.5V± 5%
D: 1.8V± 5%
E: 3.3V± 5%

Table 1: Frequency Stability vs Operating Temperature

Operating Temp.	±0.5ppm	±1.0ppm	±1.5ppm	±2.0ppm	±2.5ppm
0°C ~ +70°C	A05	A10	A15	A20	A25
-10°C ~ +60°C	B05	B10	B15	B20	B25
-20°C ~ +70°C	C05	C10	C15	C20	C25
-30°C ~ +75°C	D05	D10	D15	D20	D25
-30°C ~ +85°C	E05	E10	E15	E20	E25
-40°C ~ +85°C	F05 (*)	F10	F15	F20	F25

(*) only available at carrier frequencies 26, 37.4, 38.4, & 48MHz

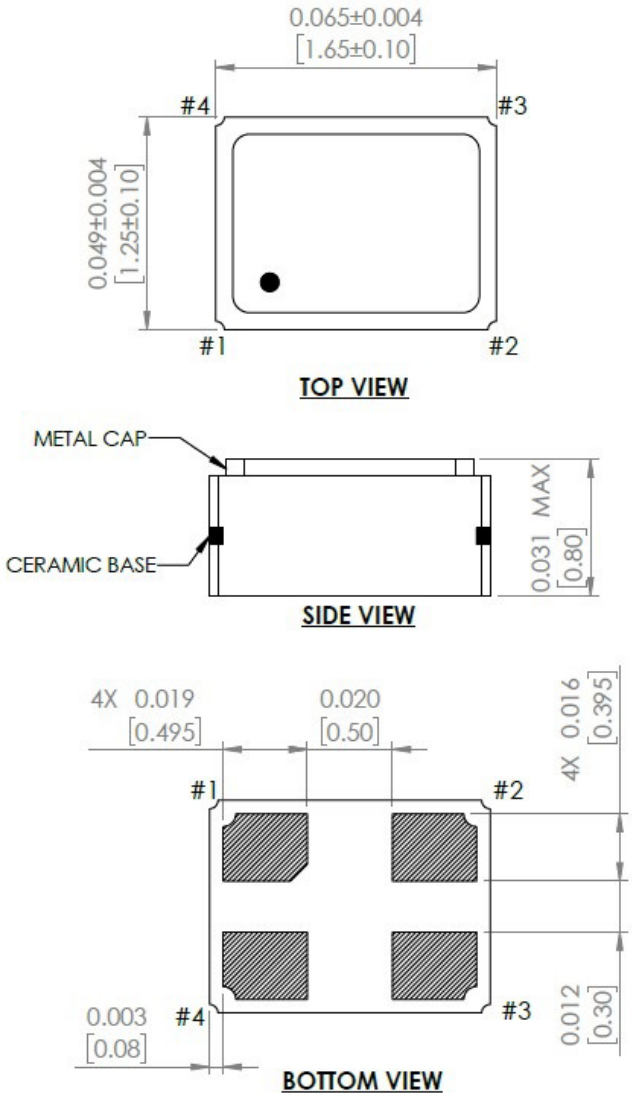
Recommended Test Circuit



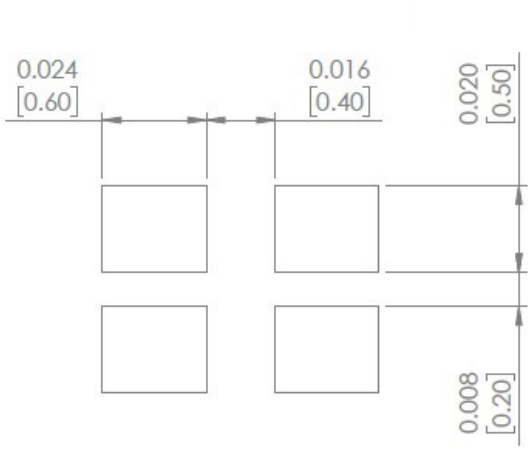
RL=10kΩ±10% CL=10pF±10%
• CL include Probe Capacitance
Co: DC Cut Capacitance

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Mechanical Dimensions



Recommended Land Pattern



Pin #	Function
1	Vcon
2	GND
3	Output
4	Vdd

Dimensions: inches (mm)

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Reflow Profile [JEDEC J-STD-020]

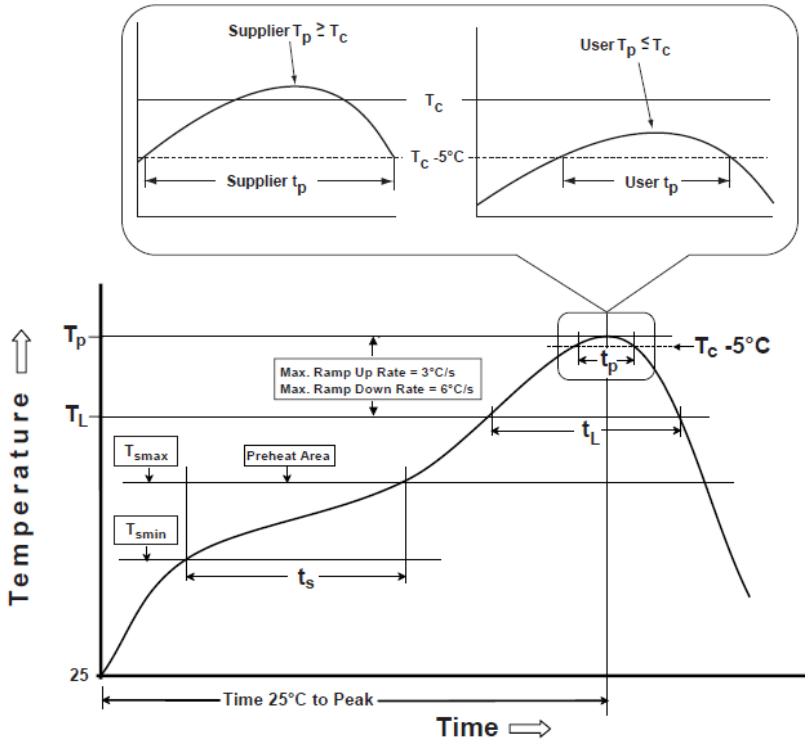


Table 1

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

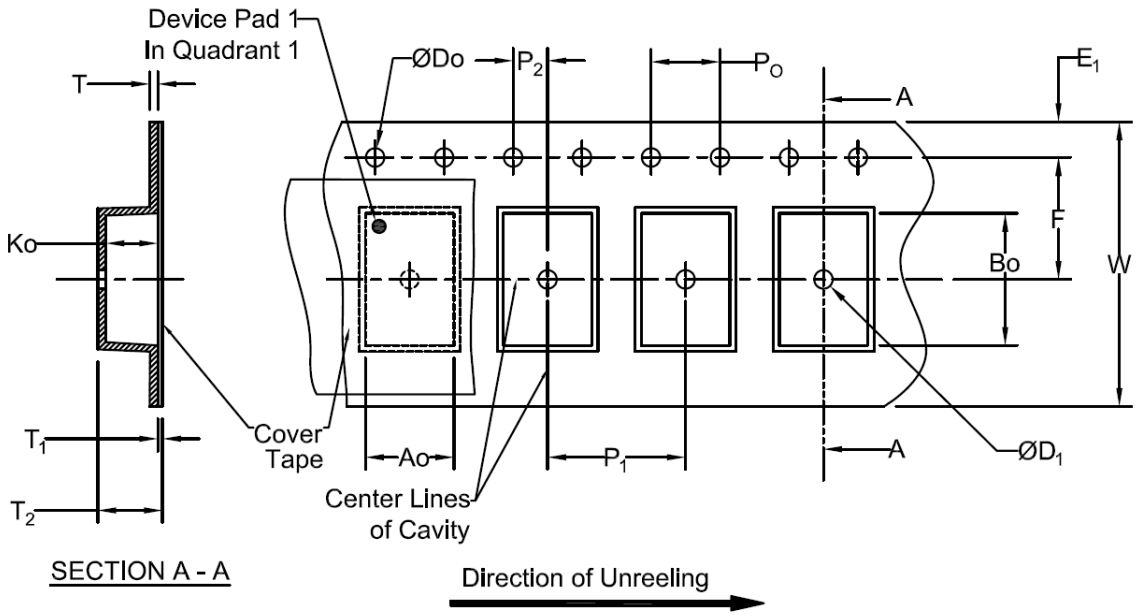
*Tolerance for peak profile temperature (T_p) is defined as a supplier minimum and a user maximum.

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

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Packaging

T: 1,000pcs/reel
T3: 3,000pcs/reel

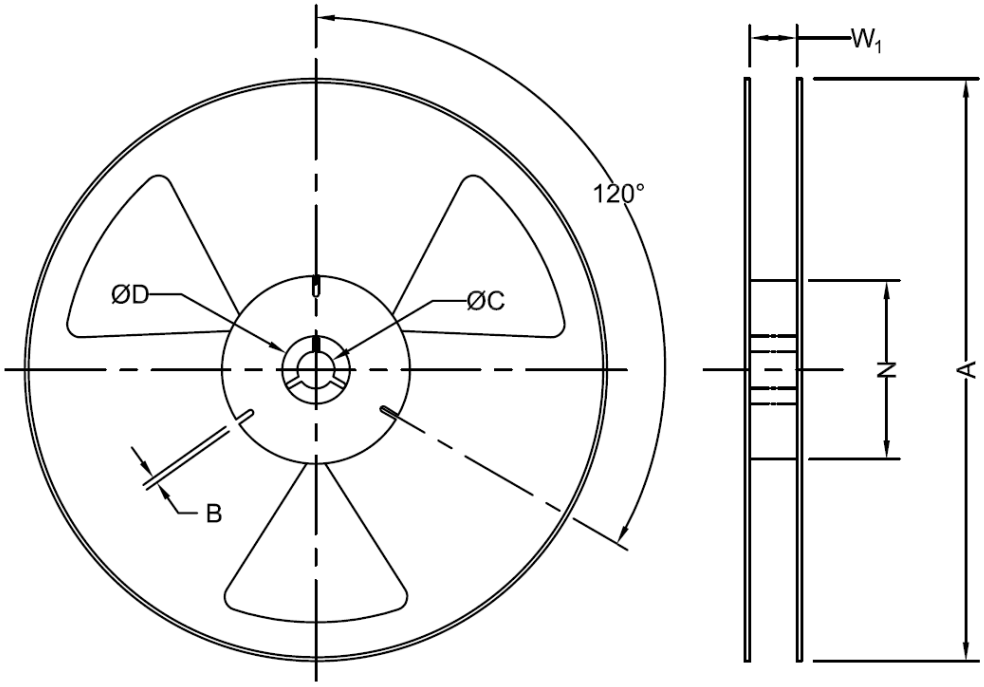


Tape Specifications (mm)							
Width	Ao	Bo	Do	D_1 (Min)	E_1	F	Ko
8mm	*	*	1.5+0.1/-0.0	1.0	1.75±0.1	3.5±0.05	*
Width	P_1	P_2	P_0	T (Max)	T_1 (Max)	T_2 (Max)	W (Max)
8mm	4.0±0.1	2.0±0.05	4.0±0.1	0.6	0.1	2.5	8.3

***Note: Compliant to EIA-481**

Dimensions: mm

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Reel Specifications (mm)							
Width	Qty/Reel	A (Nom)	B (Min)	C (Min)	D (Min)	N (Min)	*W_1
8mm	1000	178	1.5	13.0+0.5/-0.2	20.2	50	8.4+1.5/-0.0
	3000	178	1.5	13.0+0.5/-0.2	20.2	50	8.4+1.5/-0.0

***Note: Measured at Hub**

Dimensions: mm

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