

# Ultra-Low Jitter, Fixed-Frequency SMD Clock Oscillator

**AX3-0006-T**

Request Samples



Check Inventory



ESD Sensitive



L x W x H mm

RoHS/RoHS II Compliant

MSL Level = 1

## Features

- Exceptionally Low RMS Jitter: < 95fs Typ (120fs Max)
- $\pm 20$ ppm stability over industrial operating temperature (0°C to +105°C)
- 1.8V supply voltage
- HCSL differential output
- Industry standard 3.2 x 2.5 x 1.0 mm footprint
- Available in Abracon's Global Distribution Network

## Applications

- PCI Express

## Electrical Specifications

Parameters	Min.	Typ.	Max.	Units	Notes
Output Frequency		100.000		MHz	
Supply Voltage (Vdd)	1.71	1.8	1.89	V	
Supply Current (Idd)		32	40	mA	
Operating Temperature Range	0		105	°C	
Storage Temperature	-55		150	°C	
Frequency Accuracy (Initial Set-Tolerance)	-10		10	ppm	Relative to the carrier at time of shipment (Pre-Reflow) @ +25°C
Frequency Stability over Operating Temperature Range	-20		20	ppm	0°C to +105°C [Note 1]
Aging over 20 Year Product Life	-15		15	ppm	[Note 2]
All-Inclusive Frequency Accuracy (Total Stability) over 20 Year Product Life	-45		45	ppm	[Note 2, 3]
Output Logic	HCSL				
Rise (Tr) / Fall (Tf) Time		0.2	0.6	ns	20% to 80% of Waveform
Duty Cycle	45		55	%	Measured at 50% of Waveform RL=50Ω to Ground
Output Voltage	V <sub>OH</sub>	0.55	1.0	V	RL=50Ω to Ground See Recommended Test Circuit
	V <sub>OL</sub>	-0.15	+0.15	V	
Output Voltage Swing (Vopp)	0.400			V	
Start-up Time		< 2	5	ms	[Note 1]
RMS Phase Jitter		0.095	0.120	pSec	12kHz -20MHz BW
Period Jitter: Cycle to Cycle			350	fSec	
Period Jitter: Long Term (10k cycles min)			750	fSec	
Output Enable & Disable Control	0.7*(Vdd)			V	Output Enable; or No Connect Output Disable; High Impedance
			0.3*(Vdd)		
Output Enable Time		< 2	5.0	ms	
Output Disable Time			0.2	μs	
Output Disable Current Consumption			30	μA	OE ≤ 0.3V

Note 1: Relative to initial measured frequency @ +25°C

Note 2: Relative to post-reflow frequency @ +25°C

Note 3: Includes temperature stability, initial frequency accuracy, load pulling, power supply variation, and 20 year aging



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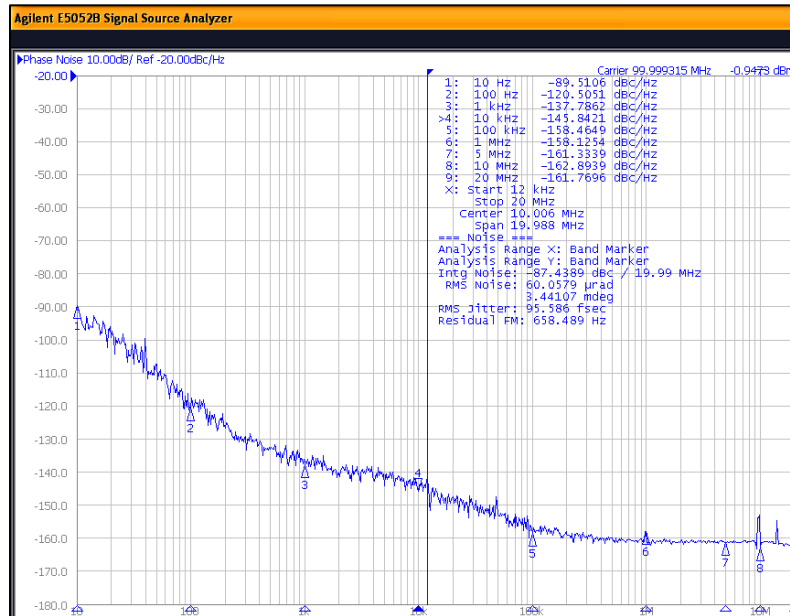


L x W x H mm

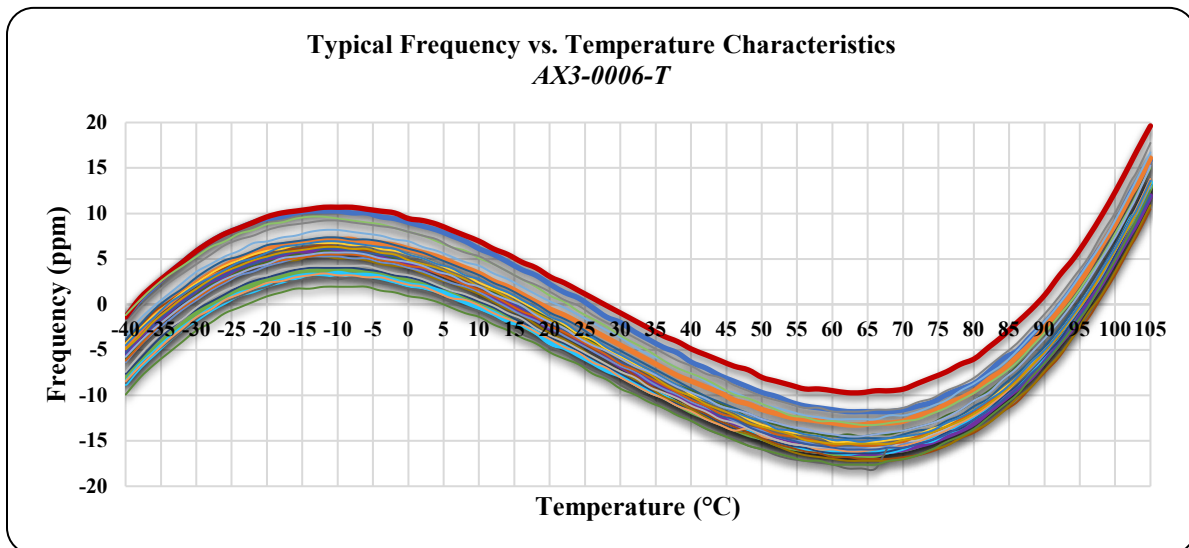
RoHS/RoHS II Compliant

MSL Level = 1

## Phase Noise Plot



## Typical Frequency vs. Temperature Characteristics



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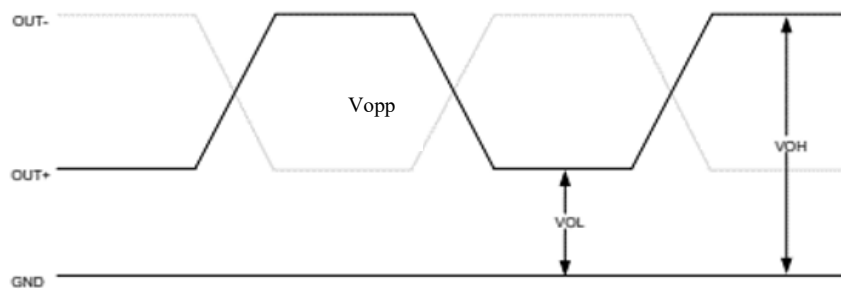
## Options and Part Identification

AX3-0006-

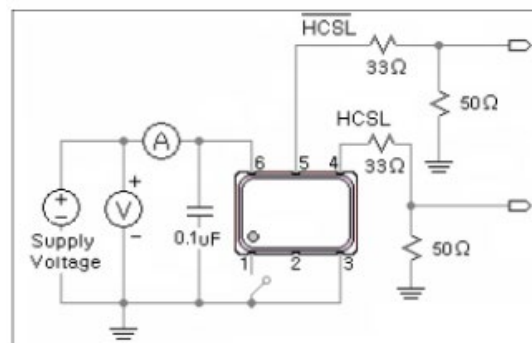
Packaging
Blank: Bulk (***)
T: Tape & Reel 1,000 units
T3: Tape & Reel 3,000 units

(\*\*\*) MOQ: 250 units

## Differential Output Waveform



## Recommended Test Circuit



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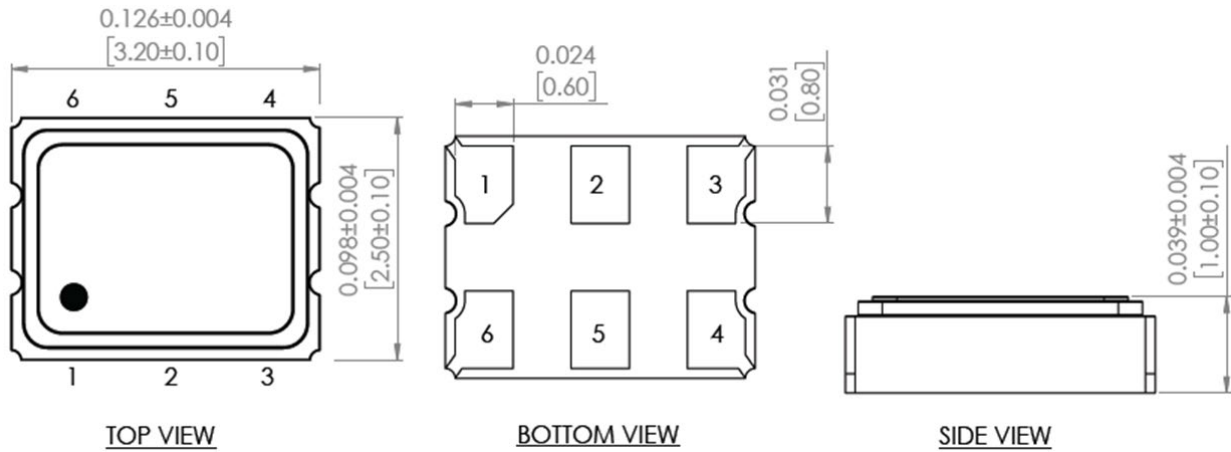


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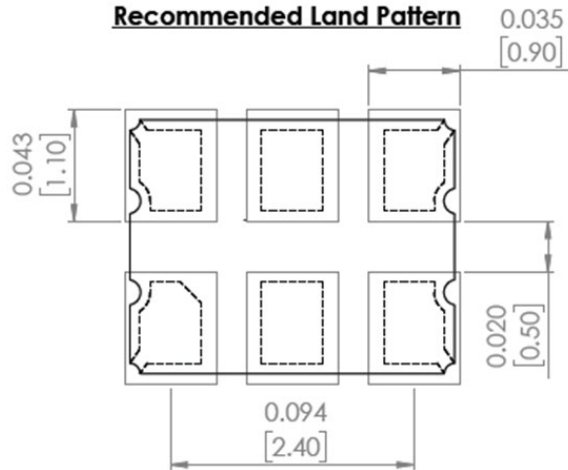
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## Mechanical Dimensions



## Recommended Land Pattern



Pin #1=Output Enable/Disable Function where OE is Active HIGH	
Pin	Description
# 1	Output Enable = Logic High, "1", Vdd
	Output Disable = Logic Low, "0", GND
# 2	No Connect
# 3	GND
# 4	Output
# 5	Complementary output
# 6	Supply Voltage (Vdd)

Dimensions: inches [mm]

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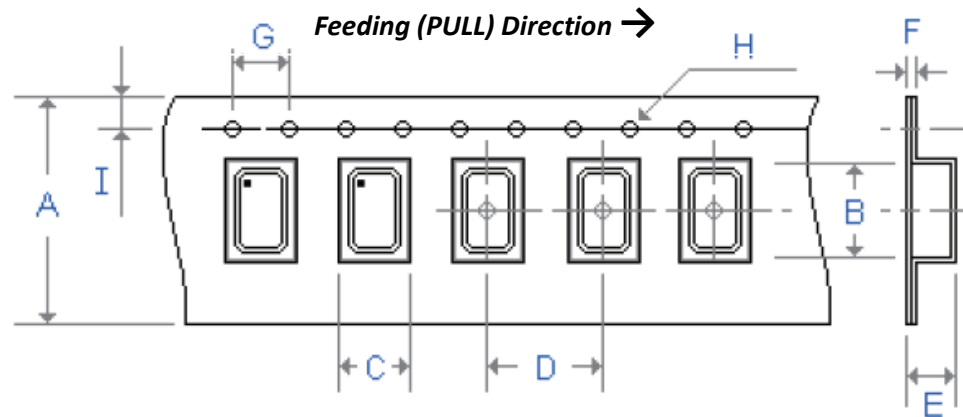
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## Packaging

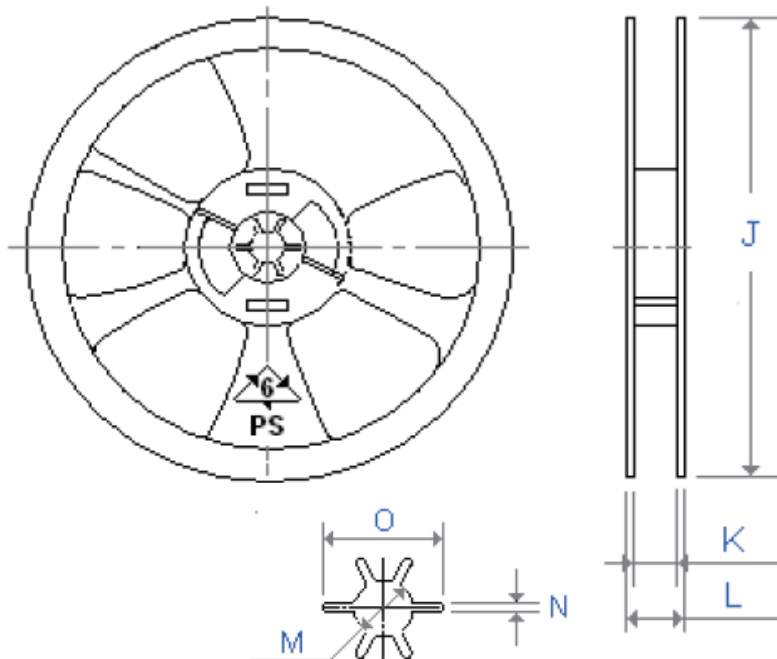
Blank = Bulk (MOQ=250 units)

T = Tape & Reel 1,000 units/reel

T3= Tape & Reel 3,000 units/reel



Tape Dimensions	
A	8.00
B	3.40
C	2.70
D	4.00
E	1.40
F	0.30
G	4.00
H	Ø1.55
I	1.75
Reel Dimensions	
J	180.00
K	10.90
L	11.40
M	13.20
N	2.20
O	22.00



Dimensions: mm



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## Reflow Profile [JEDEC J-STD-020]

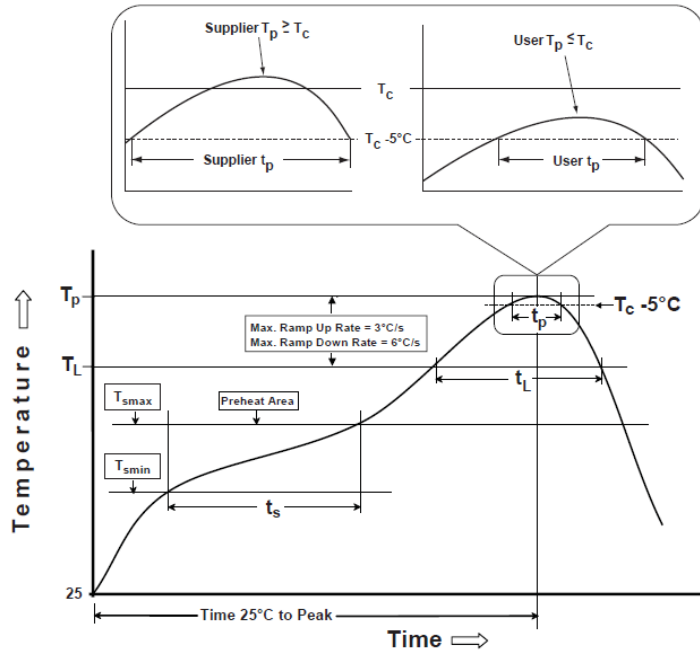


Table 1

### SnPb Eutectic Process Classification Temperatures ( $T_c$ )

Package Thickness	Volume mm <sup>3</sup> <350	Volume mm <sup>3</sup> $\geq 350$
<2.5 mm	235 °C	220 °C
$\geq 2.5$ 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
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 a supplier minimum and a user maximum.

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