Ultra-Low Jitter, Fixed-Frequency SMD Clock Oscillator

AK3B-0002-T

ESD Sensitive

3.2 x 2.5 x 1.0 mm
RoHS/RoHS II Compliant
MSL Level = N/A

Key Electrical Specifications

Parameters			Min.	Typ.	Max.	Unit	Notes
Frequency				156.25		MHz	
Supply Voltage (Vdd) [Note 1]			2.97	3.3	3.63	V	
Supply Current (Idd)		HCSL		32	40	mA	
Operating Temperature Range			-40		85	°C	
Storage Temperature			-55		125	°C	
Frequency Tolerance [Note 2]			-10	< ±5	10	ppm	
Frequency Stability over [Note 3,4] Operating Temperature Range			-25	< ±20	25	ppm	
First Year Aging			-3		3		At 25°C
All-Inclusive Frequency Accuracy (Total Stability) [Notes 5]			-50		50	ppm	
Rise (Tr) / Fall (Tf) Time [Notes 6]		HCSL		0.2	0.6	ns	R_L=50Ω to ground on each output
Duty Cycle			45		55	%	
Start-up Time [Note 3]				< 2	5	ms	
Differential Output High Voltage	HCSL	V_{OH}	0.55	0.74	1.00	V	R_L=50Ω to ground on each output
Output Low Voltage	HCSL	V_{OL}	-0.15	0.00	0.15	V	R_L=50Ω to ground on each output
Output Voltage Swing (Vopp)			0.450	0.700	0.850	V	
Output Enable & Disable Control			0.7*(V_{dd})			V	Output Enable or No Connect
					0.3*(V_{dd})	V	Output Disable (High
Output Enable Time				< 1	5.0	ms	
Output Disable Time					0.2	µs	
Output Disable Current Consumption					30	µA	OE ≤ 0.3V
RMS Phase Jitter (12kHz to 20MHz from Carrier) [Note 7, 8, 9]				60	80	fsec	

Note 1: Supply voltage (Vdd) = 1.8V option not available with LVPECL output
Note 2: Frequency Accuracy (Initial Set-Tolerance), at time of shipment (pre-reflow), relative to carrier frequency, @ +25°C
Note 3: Relative to initial measured frequency @ +25°C
Note 4: Option Q only available in select frequencies. Please contact Abracon for availability
Note 5: Includes post reflow frequency accuracy, temperature stability, load pulling, power supply variation, and 10-year aging
Note 6: Measured over 20% to 80% of waveform
Note 7: Guaranteed by characterization; RMS Phase Jitter specifications are inclusive of any spurs
Note 8: Phase jitter measured with Keysight E5052B Signal Source Analyzer
Note 9: Refer to the next section for phase noise test setup and representative phase noise plots

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Absolute Maximum Ratings [Note 10]

Parameters	Min.	Typ.	Max.	Unit	Notes
Supply Voltage	-0.3		4.5	V	
Input Voltage	-0.3		V_{DD}+0.3	V	
Output Voltage	-0.3		V_{DD}+0.3	V	
Maximum Junction Operating Temperature			150	ºC	
Ambient Operating Temperature Range	-40		85	ºC	Industrial
Ambient Operating Temperature Range	-20		70	ºC	Extended Commercial
Reflow Temperature			260	°C	See Reflow Profile
ESD Protection	4kV HBM, 300V MM, 2kV CDM				

Note 10: Stresses above those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. This is a stress rating only and functional operation of the device at those or any other conditions above those indicated in the operational sections of this specification is not intended. Exposure to maximum rating conditions for extended periods may affect device reliability. The data sheet limits are not guaranteed if the device is operated beyond the recommended operating conditions.

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Options and Part Identification

AK3B-0002-▢

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

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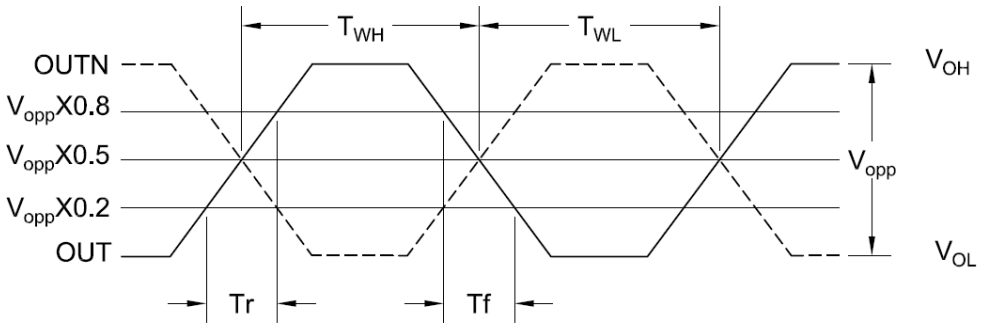
Differential Output Waveform

HCSL: Output Wave Form (Duty, Tr, Tf, VOH, VOL, Vopp)



$$\text{Duty Cycle} = \frac{T_{WH}}{T_{WH}+T_{WL}} \text{ X } 100\%$$

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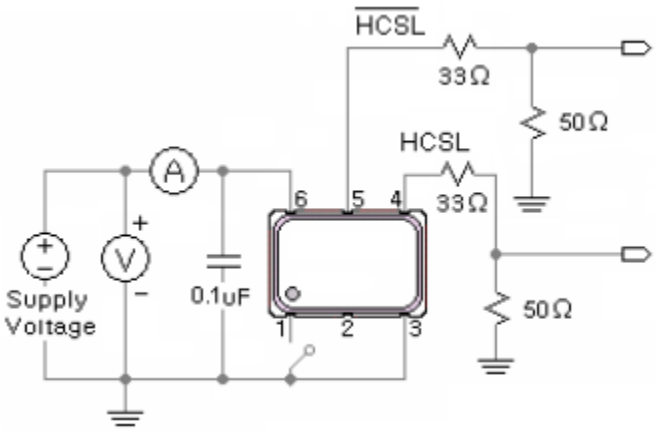
Recommended Test Circuit

HCSL



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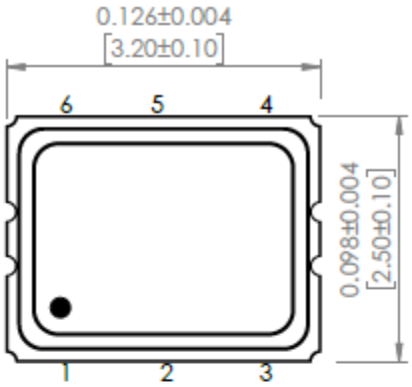
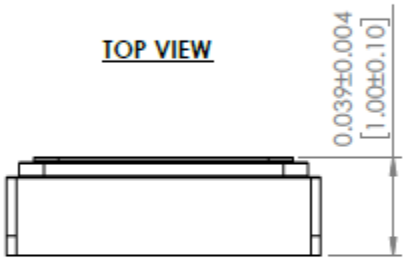
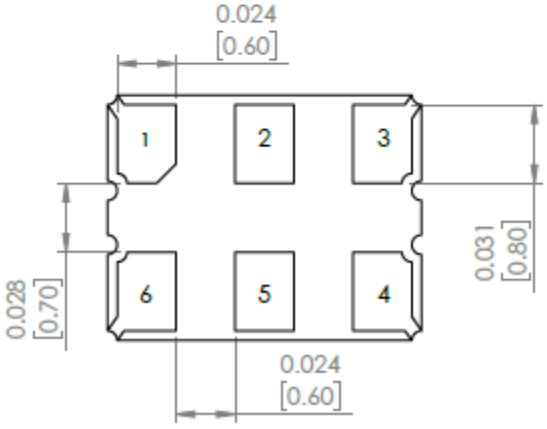
Mechanical Dimensions



TOP VIEW

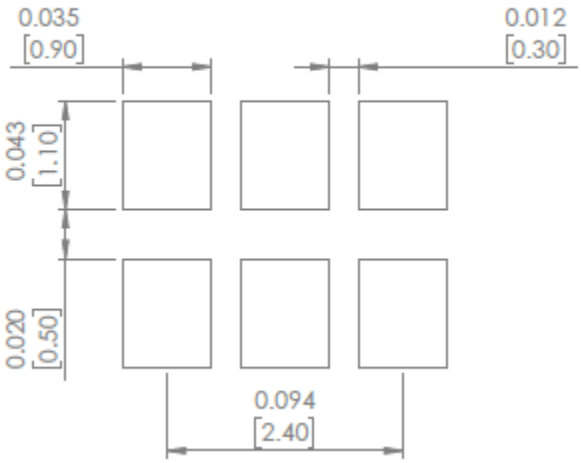


SIDE VIEW



BOTTOM VIEW

Recommended Land Pattern



Case 1 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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Reflow Profile [JEDEC J-STD-020]

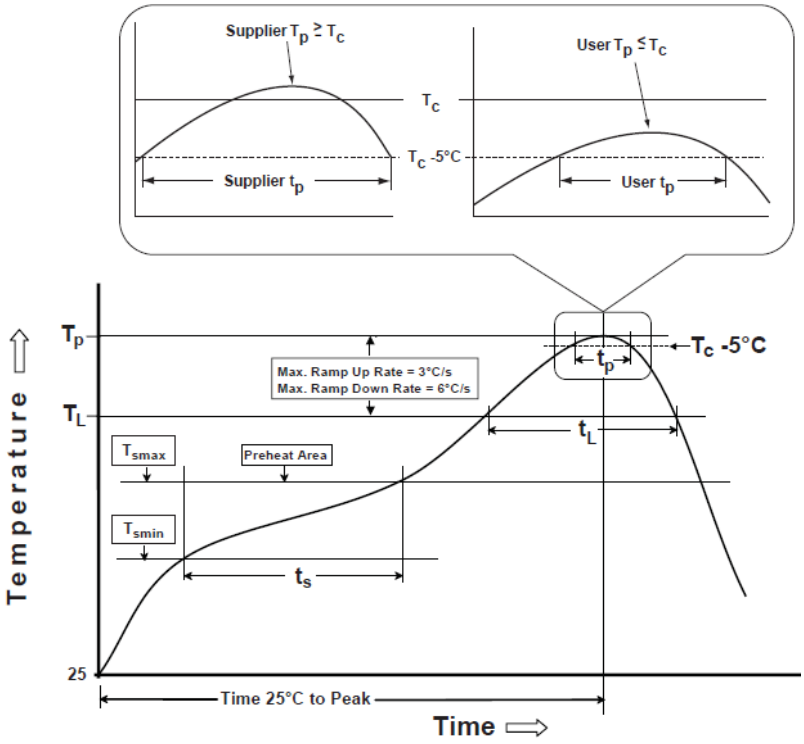

Table 1

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

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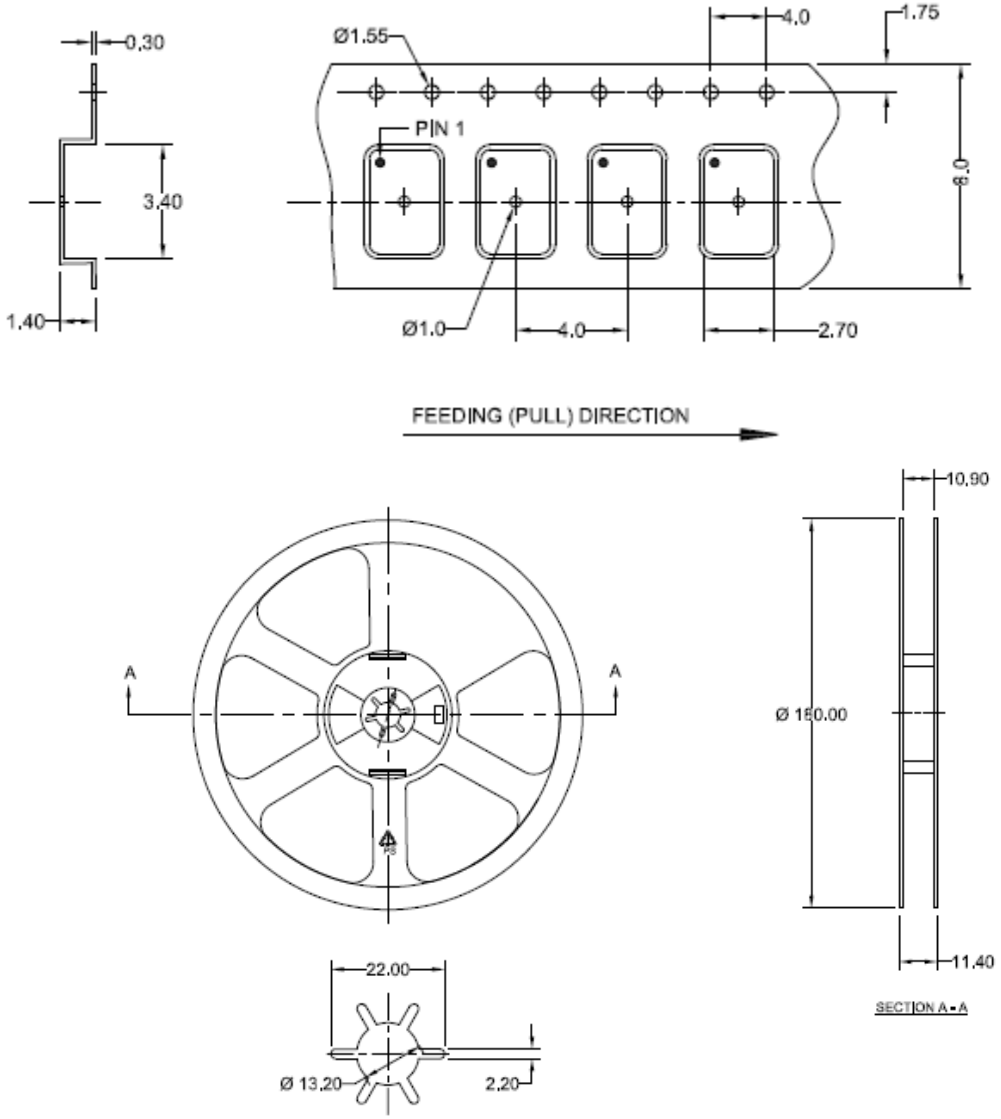
T = Tape & Reel 1,000 units/reel
T3= Tape & Reel 3,000 units/reel



Dimensions: mm

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