ASDK Series

32.768kHz Ceramic SMD Crystal Oscillator

Description

Abracon's ASDK series is a low power 32.768 kHz crystal oscillator within a 2.5 mm x 2.0 mm x 0.95 mm package. This series offers various supply voltage options at 1.8V, 2.5V and 3.3V. The ASDK delivers a CMOS output with a ±20 ppm frequency stability. This series has an output enable/disable feature, with a low 5 µA typical disable current.



Features

- Optimized for low current consumption
- Output Enable/Start & Disable/Stop function
- Output waveform CMOS/LVCMOS compatible
- Hermetically seam-sealed ceramic package
- REACH/RoHS II Compliant | MSL Level 1
- Pb free

Typical Applications

- Portable & wearable electronics
- Internet of Things (IoT)
- Consumer electronics
- Industrial control & automation
- Mobile communication

Electrical Specifications

Parameters		Min.	Typ.	Max.	Unit	Notes
Frequency			32.768		kHz	
Operating Temperature Range		0		+70	°C	See options
Storage Temperature Range		-55		+125	°C	
Overall Frequency Stability		-100		+100	ppm	See options
Supply Voltage (Vdd)		2.97	3.3	3.66	V	Standard
		2.375	2.5	2.625		Option 1
		1.71	1.8	1.89		Option 2
Tri-state function		"1" (VIH≥0.7*Vdd) or Open: Oscillation; "0" (VIL<0.3*Vdd): No Oscillation/Hi Z			V	
Output Load				15	pF	CMOS
Output Voltage	V_{OH}	0.9*Vdd			V	
	V_{OL}			0.1*Vdd		
Aging 1 year @25°C± 3°C		-3.0		+3.0	ppm	
Symmetry @ ½ Vdd		40	50	60	%	Standard
		45	50	55		Option S
Start-up Time			≤ 2	5	ms	
Rise and Fall Time (Tr/Tf)			43	50	ns	
Disable Current				10	µA	
Supply Current (Idd) @25°C± 3°C	Vdd = 3.3V		2.2	3.5	mA	
	Vdd = 2.5V		1.2	2.5		
	Vdd = 1.8V		1.0	1.5		

Part Identification

ASDK ☐ -32.768kHz- ☐ - ☐ - ☐ - ☐

Supply Voltage
Blank: 3.3V±10%
1: 2.5 V±5%
2: 1.8 V±5%

Operating Temp.
Blank: 0°C ~ +70°C
E: -20°C ~ +70°C
F: -30°C ~ +70°C
N: -30°C ~ +85°C
L: -40°C ~ +85°C

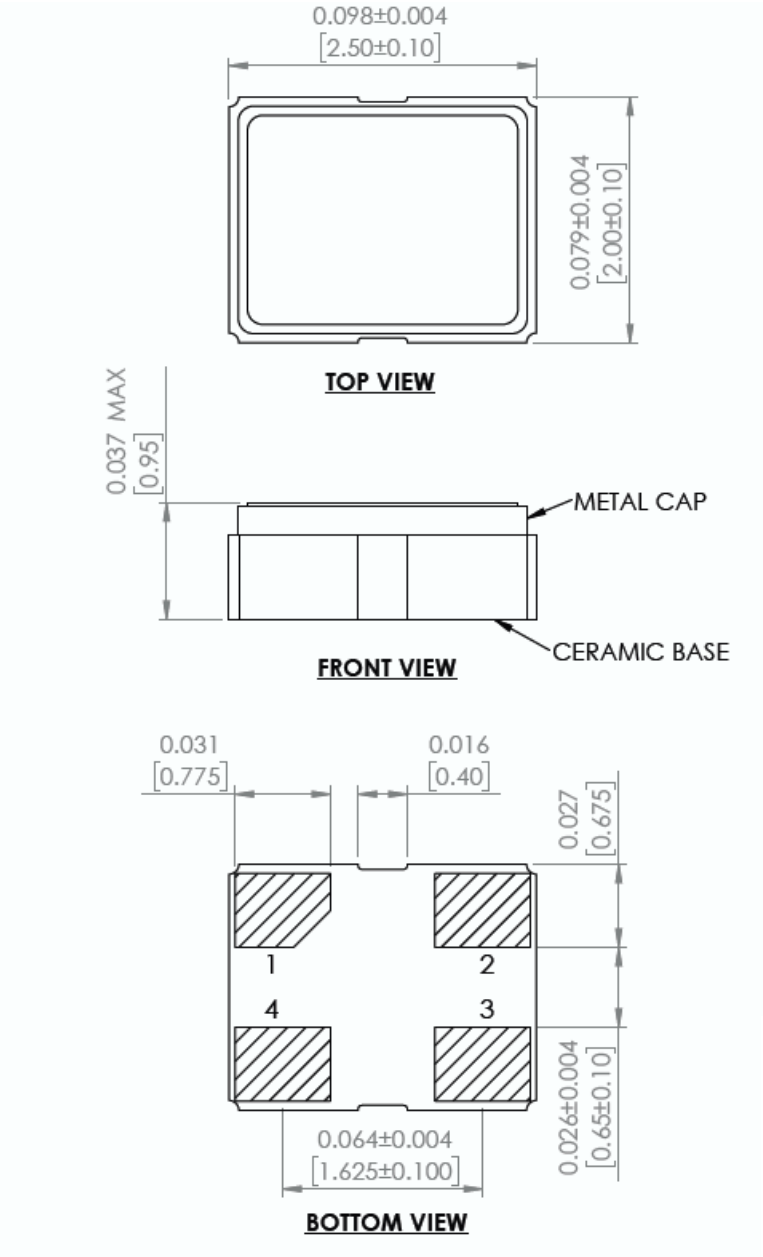
Overall Freq. Stability
Blank: ±100ppm
J: ±20ppm (*)
R: ±25ppm
K: ±30 ppm
C: ±50 ppm

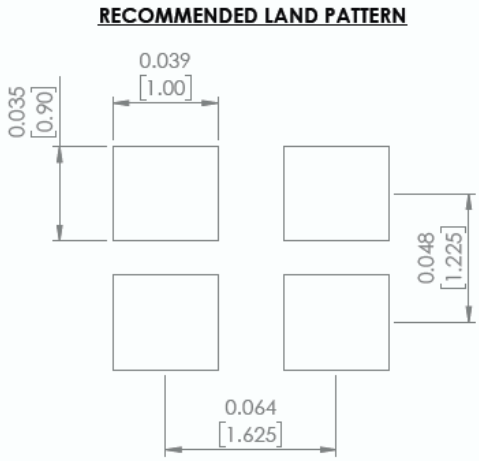
Symmetry
Blank: 40/60%
S: 45/55%

Packaging
Blank: Bulk
T: 1K Tape & reel
T3: 3K Tape & reel

* For Temp option E, F, N and 0° C to + 70° C only

Mechanical Dimensions





Pin #	Function
1	$\overline{\text{INH}}$
2	GND
3	Output
4	Vdd

$\overline{\text{INH}}$ Function	
#1	#3 (Output)
Open	Active
"H" Level	Active
"L" Level	High Z (No Oscillation)

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

Dimensions: inches (mm)

Reflow Profile [JEDEC J-STD-020]

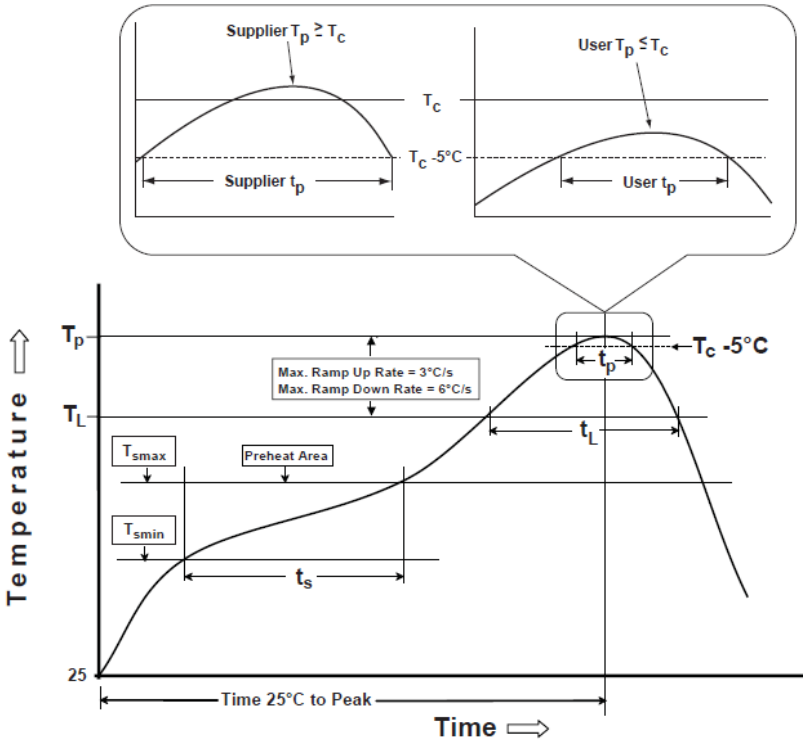


Table 1

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

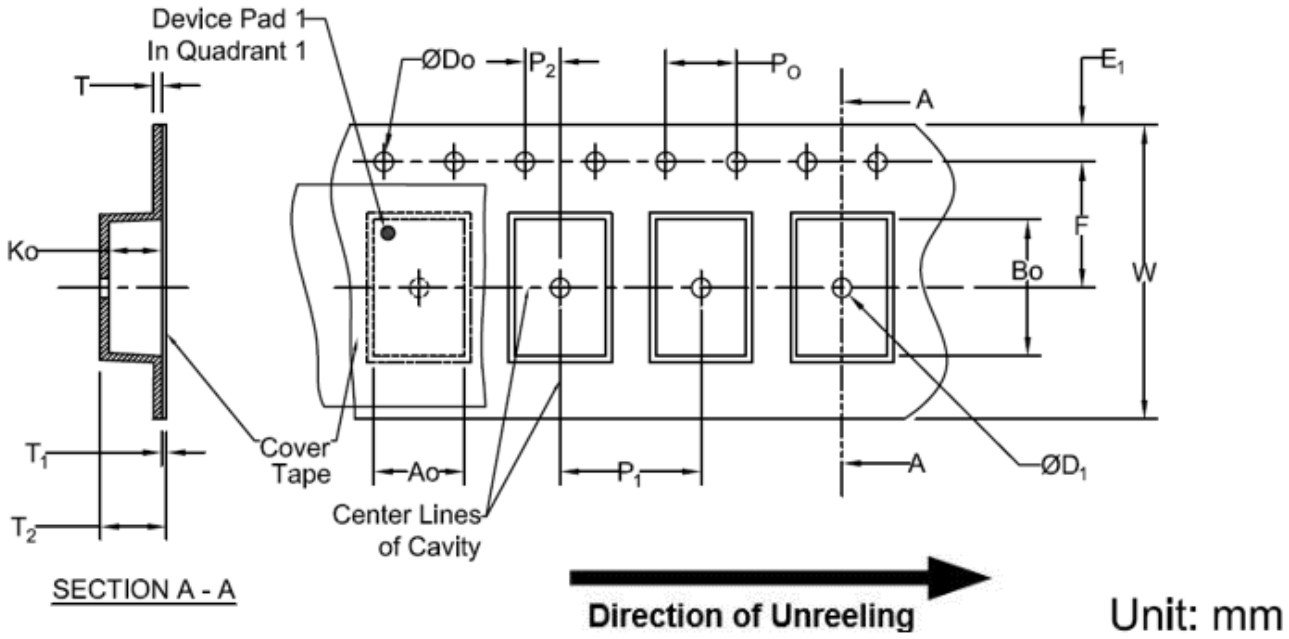
Profile Feature	Sn-Pb Eutectic Assembly	Pb-Free Assembly
Preheat / soak		
Temperature minimum (T_{smin})	100°C	150°C
Temperature maximum (T_{smax})	150°C	200°C
Time (T_{smin} to T_{smax}) (t_s)	60 - 120 sec.	60 - 120 sec.
Average ramp-up rate (T_{smax} to T_P)	3°C/sec. max	3°C/sec. max
Liquidous temperature (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.

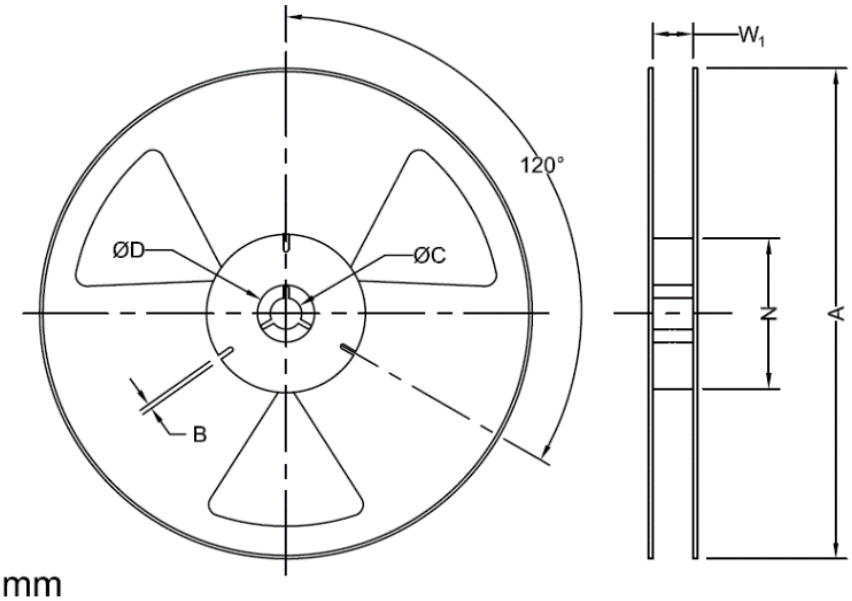
Packaging

T: 1,000pcs/reel
T3 : 3000pcs/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**



Unit: mm

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**