



actual size

# Oscillator JO32 · 32.768 kHz · AT-cut

- SMD Oscillator with Stop Function · 3.2 x 2.5 mm
- High frequency stability up to +125 °C
- Variable supply voltage 1.8 V ~ 3.3 V
- Extremely low current consumption
- Seam sealed ceramic/metal package



RoHS compliant



Pb free



REACH compliant



Conflict mineral free

## GENERAL DATA

TYPE		JO32 32.768 kHz AT-cut 1.8 V ~ 3.3 V
frequency		32.768 kHz
frequency stability over all*		± 25 ppm ~ ± 100 ppm (table 1)
current consumption		see table 2
supply voltage V <sub>DC</sub>		1.8 V -10 % ~ 3.3 V +10 % variable
temperature	operating	-10 °C ~ +70 °C up to -40 °C ~ +125 °C (table 1)
	storage	-55 °C ~ +125 °C
output	rise & fall time	10 ns typ. / 50 ns max.
	load max.	15 pF
	current max.	1.0 mA
	low level max.	0.4 V
	high level min.	V <sub>DC</sub> - 0.4 V
output enable time max.		5 ms
output disable time max.		1 µs
start-up time max.		5 ms (t <sub>0</sub> when V <sub>DC</sub> > 1.62 V)
standby function		stop
standby current max.		5 µA (T1) / 10 µA (T2, T3)
symmetry at 0.5 x V <sub>DC</sub>		45 % ~ 55 % max. (ref. +25 °C)

note: rise time: 0.1 VDC ~ 0.9 VDC / fall time: 0.9 VDC ~ 0.1 VDC

## TABLE 1: FREQUENCY STABILITY CODE

stability code / temp. code		A	B	G	C
		± 100 ppm	± 50 ppm	± 30 ppm	± 25 ppm
-20 °C ~ +70 °C		○	○	○	○
-40 °C ~ +85 °C	T1	○	○	○	
-40 °C ~ +105 °C	T2	○	○		
-40 °C ~ +125 °C	T3	○			

○ available

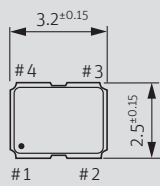
\* includes stability at 25 °C, operating temp. range, supply voltage change, shock and vibration, aging 1st year

## TABLE 2: CURRENT CONSUMPTION MAX.

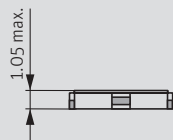
Supply current max.	load	1.8 V	2.5 V	3.3 V
at 32.768 kHz	5 pF	31.0 µA	32.0 µA	32.5 µA
	10 pF	31.5 µA	32.5 µA	33.0 µA
	15 pF	32.0 µA	33.0 µA	33.5 µA

note: please also refer to I/V plots showing typical supply current at 5 pF / 10 pF / 15 pF

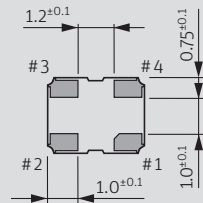
## DIMENSIONS



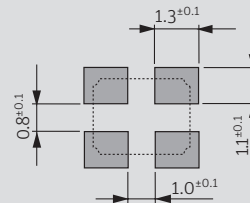
top view



side view



bottom view



pad layout

- # 1: e/d
- # 2: ground
- # 3: output
- # 4: V<sub>DC</sub>

pin connection

in mm

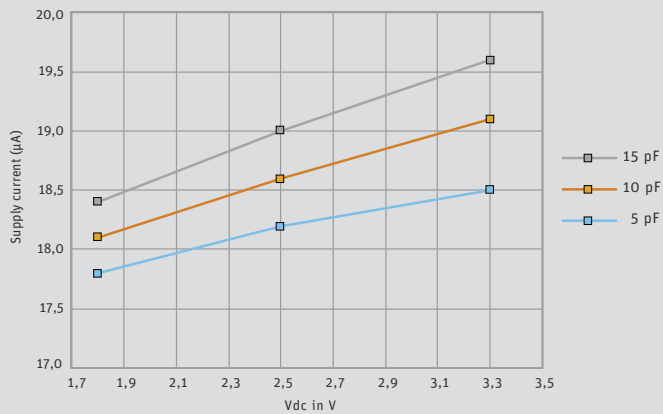
## ORDER INFORMATION

0	frequency	type	frequency stability code	supply voltage code	output load code	option	power option identification
Oscillator	0.032768 = 32.768 kHz	JO32	see table 1	1V3 = 1.8 V ~ 3.3 V	1 = 15 pF	blank = -20 °C ~ +70 °C T1 = -40 °C ~ +85 °C T2 = -40 °C ~ +105 °C T3 = -40 °C ~ +125 °C	OP = optimized power consumption

Example: **0 0.032768-JO32-G-1V3-1-T1-OP-LF** (Suffix LF = RoHS compliant / Pb free)

# Oscillator J032 · 32.768 kHz · AT-cut · Stop Function

## TYPICAL SUPPLY CURRENT VS. $V_{DC}$ AT DIFFERENT LOAD CAPACITANCES



## ENABLE / DISABLE FUNCTION

pin #1 (e/d control)	pin #3 (output)
open	active
high "1" ( $V_{IH} \geq 0.7 V_{DC}$ )	active
low "0" ( $V_{IL} \leq 0.3 V_{DC}$ )	high impedance

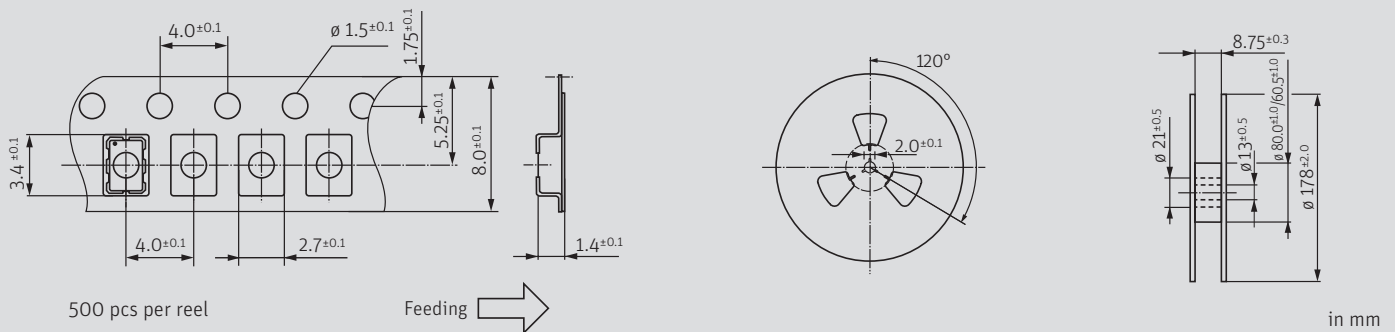
**stop function:**

- oscillator stops
- output high impedance

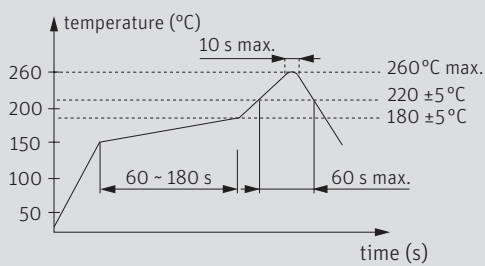
## PACKAGING NOTE

- standard packing unit is 500 pieces per reel
- non-multiple packing units are only supplied taped / bulk

## TAPING SPECIFICATION



## REFLOW SOLDERING PROFILE



## MARKING

**frequency**  
**company / stability code / date code**

date code: A ~ M: Jan. - Dec.

9: 2019   0: 2020   1: 2021   2: 2022   3: 2023   4: 2024

Jan.	Febr.	Mar.	Apr.	May	June
A	B	C	D	E	F
July	Aug.	Sept.	Oct.	Nov.	Dec.
G	H	J	K	L	M