



actual size

Oscillator JRO32 • 32.768 kHz

- Ceramic / Metal Package, 3.2 x 2.5 mm
- Low Power Type for Real Time Clocks (RTC)
- Uses Internal Tuning Fork Crystal
- Variable Supply Voltage 1.5 – 5.0 V



RoHS compliant



Pb free



REACH compliant



Conflict mineral free

GENERAL DATA	
TYPE	JRO32 32.768 kHz for Real Time Clocks
frequency	32.768 kHz
frequency tolerance at 25 °C	+5 ±20 ppm
frequency stability over temp. (ref to frequ. at +25 °C)	-90 ppm ~ +10 ppm for -20 °C ~ +70 °C
	-140 ppm ~ +10 ppm for -40 °C ~ +85 °C
current consumption (no load)	2.5 µA (5.0 V), 1.5 µA (3.3 V)
supply voltage range V_{DC}	1.5 V ±10% ~ 5.0 V ±10%
temperature	operating* -10 °C ~ +70 °C / -40 °C ~ +85 °C
	storage -55 °C ~ +125 °C
output	rise & fall time 200 ns
	load max. 15 pF
	current max. 400 µA
	low level max. 0.4 V
	high level min. $V_{DC} - 0.4$ V
output enable time	0.15 s/typ. 0.5 s/max.
output disable time max.	150 ns
start-up time max.	1 s
standby function	tristate
standby current max.	1 µA
symmetry at 0.5 x V_{DC}	40% ~ 60% max.

ENABLE / DISABLE FUNCTION	
pin #1 (e/d control)	pin #3 (output)
open	undefined
high "1" ($V_{IH} \geq 0.8 V_{DC}$)	active
low "0" ($V_{IL} \leq 0.2 V_{DC}$)	high impedance
enable condition:	disabled conditions:
<ul style="list-style-type: none"> pull the e/d pin to "H" if the oscillator should always be enabled pin #1 should never be left open 	<ul style="list-style-type: none"> internal oscillator active output disabled, high impedance

CURRENT CONSUMPTION	
V_{DC}	at 15 pF
5.0 V	7.0 µA
3.3 V	5.5 µA
2.8 V	5.0 µA
2.5 V	4.5 µA
1.8 V	3.5 µA
1.5 V	3.0 µA

NOTE
* a wider temperature range up to +105 °C may be available, ask for availability

DIMENSIONS

top view side view bottom view pad layout pin connection in mm

1: e/d
2: ground
3: output
4: V_{DC}

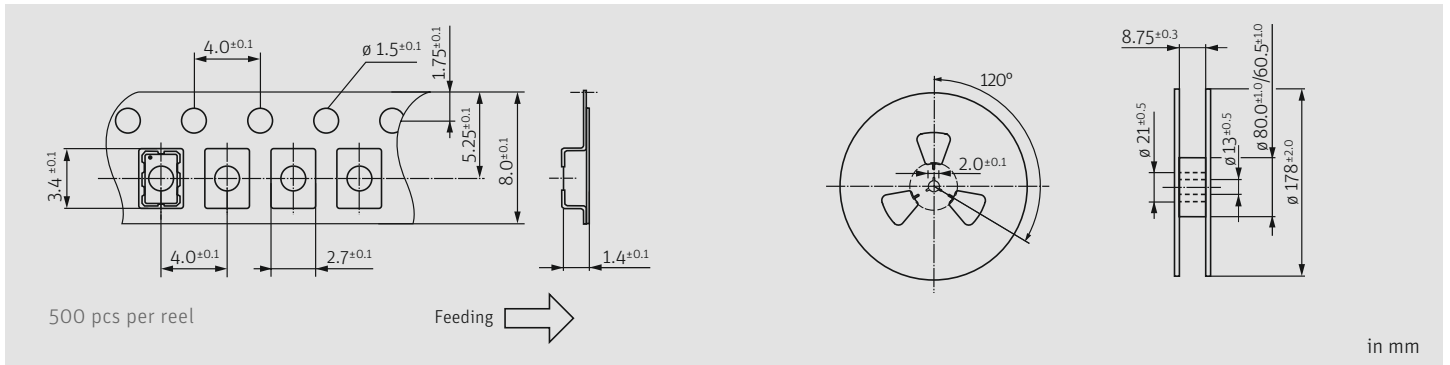
ORDER INFORMATION

0	frequency	type	frequency stability code	supply voltage code	output load code	option
Oscillator	0.032768 MHz	JRO32	TF = tuning fork characteristics	V = variable supply voltage 1.5 V ~ 5.0 V	1 = 15 pF	blank = -20 °C ~ +70 °C T1 = -40 °C ~ +85 °C T1 = -40 °C ~ +105 °C (ask)

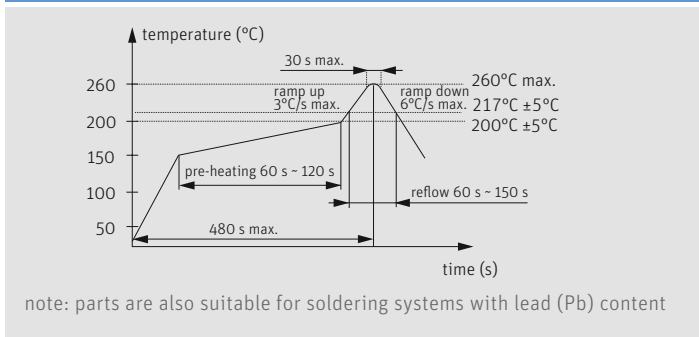
Example: 0 0.032768-JRO32-TF-V-1-T1-LF (Suffix LF = RoHS compliant / Pb free)

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TAPING SPECIFICATION



REFLOW SOLDERING PROFILE



MARKING

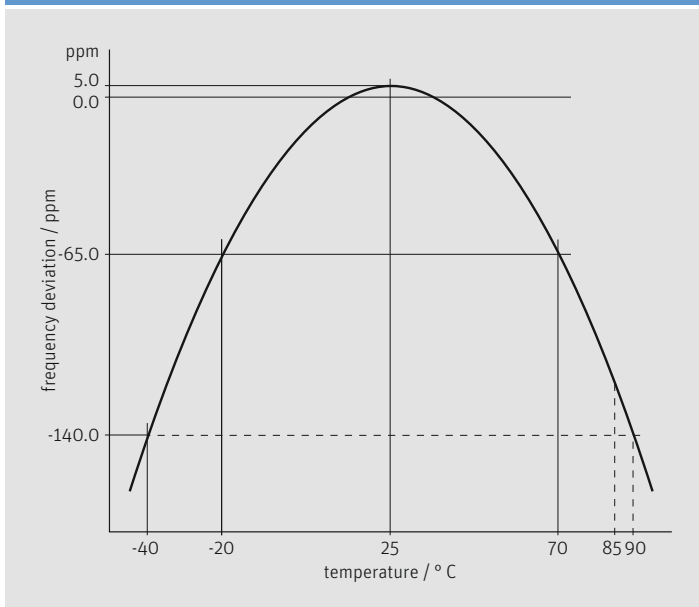
frequency / date code

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

3: 2023 4: 2024 5: 2025 6: 2026 7: 2027 8: 2028

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

NOMINAL TEMPERATURE CHARACTERISTICS



PACKAGING NOTE

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