



actual size

# Oscillator · JRO32

## Low Power/Low Frequency Oscillator

- low power type for Real Time Clocks (RTC)
- uses tuning fork crystal
- RoHS compliant, ceramic/metal package
- reflow soldering temperature: 260 °C max.



### General Data

type	JRO32 for Real Time Clock	
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 <sub>DC</sub>	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 <sub>DC</sub> - 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 <sub>DC</sub>	40% ~ 60% max.	

### Enable / Disable Function

pin #1 (e/d control)	pin #3 (output)
open	undefined
high "1" (V <sub>IH</sub> ≥ 0.8 V <sub>DC</sub> )	active
low "0" (V <sub>IL</sub> ≤ 0.2 V <sub>DC</sub> )	high impedance
<b>disabled conditions:</b>	<b>enable condition:</b>
<ul style="list-style-type: none"> <li>• internal oscillator active</li> <li>• output disabled, high impedance</li> </ul>	<ul style="list-style-type: none"> <li>• pull the e/d pin to „H“ if the oscillator should always be enabled</li> </ul>

### Current Consumption

V <sub>DC</sub>	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

### Marking

frequency / date code

date code:

A ~ M: Jan. - Dec.

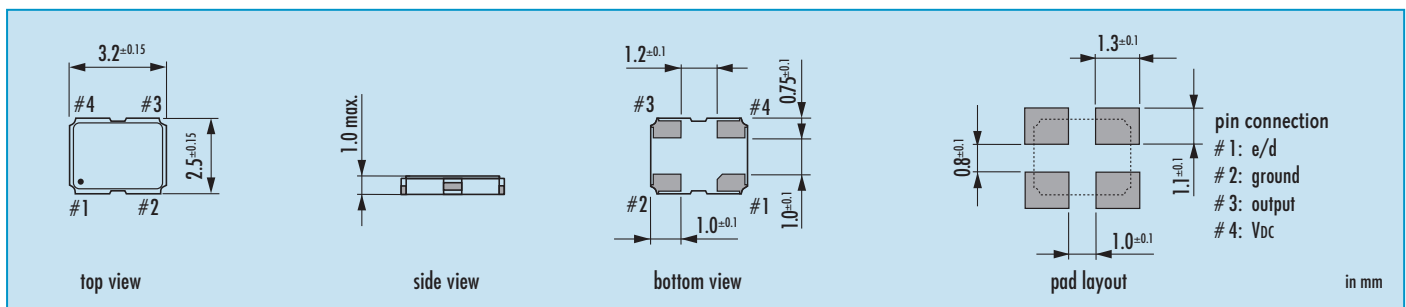
9: 2009

0: 2010

1: 2011

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

### Dimensions



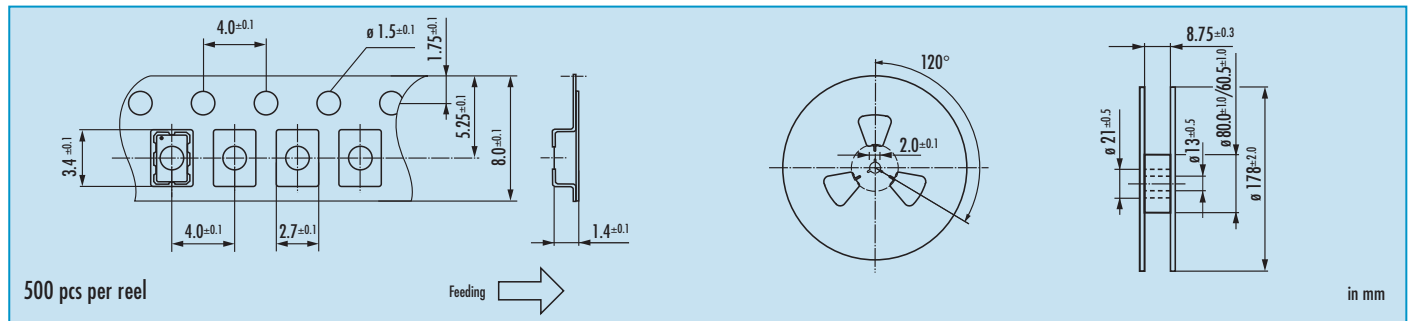
### Order Information

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 = 15 pF	blank = -20 °C ~ +70 °C T1 = -40 °C ~ +85 °C

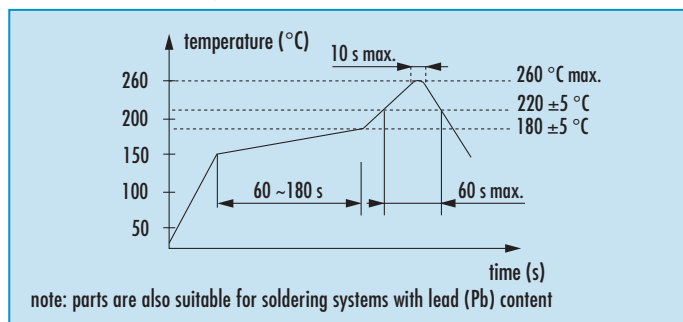
Example: O 0.032768-JRO32-TF-V-1-T1 (LF = RoHS compliant / Pb free pads)

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## Taping Specification



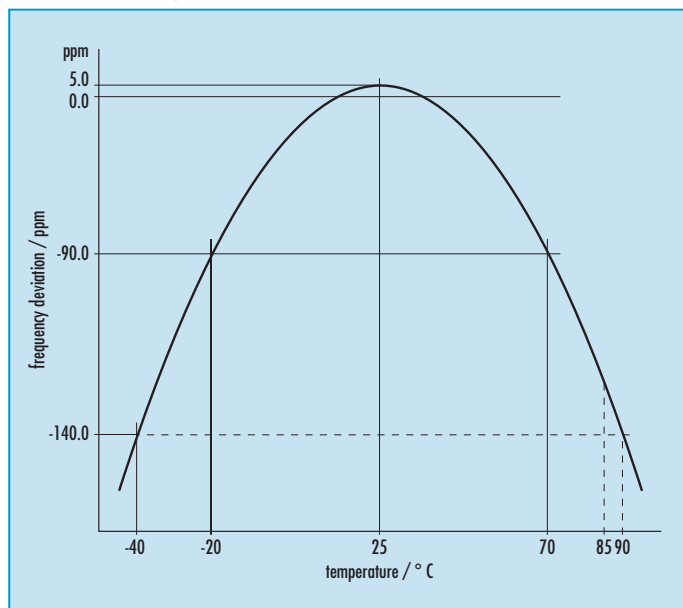
## Reflow Soldering Profile



## Packing Note

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

## Nominal Temperature Characteristic



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All specifications are subject to change without notice