



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 <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>enable condition:</b> <ul style="list-style-type: none"> <li>pull the e/d pin to "H" if the oscillator should always be enabled</li> <li>pin #1 should never be left open</li> </ul> |                 |
| <b>disabled conditions:</b> <ul style="list-style-type: none"> <li>internal oscillator active</li> <li>output disabled, high impedance</li> </ul>                                       |                 |

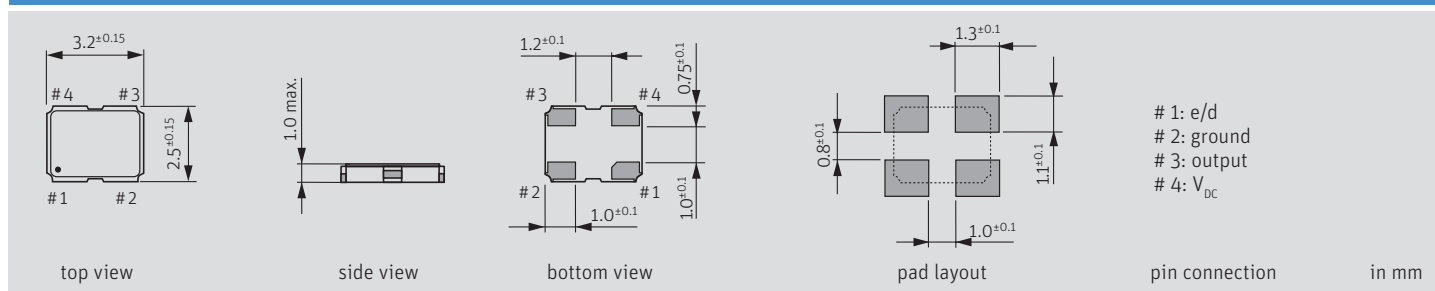
## CURRENT CONSUMPTION

| 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   |

## NOTE

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

## DIMENSIONS

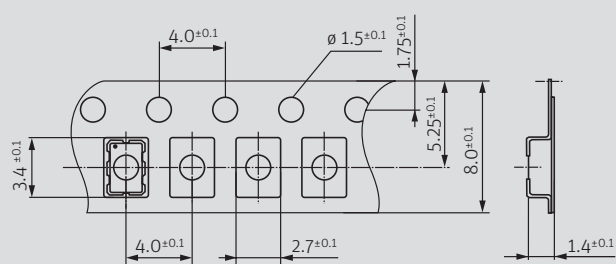


## ORDER INFORMATION

| 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 1.5 V ~ 5.0 V | 1 = 15 pF        | blank = -20 °C ~ +70 °C<br>T1 = -40 °C ~ +85 °C<br>T2 = -40 °C ~ +105 °C (ask) |
| <b>Example: 0 0.032768-JRO32-TF-V-1-T1-LF</b> (Suffix LF = RoHS compliant / Pb free) |              |       |                                  |                                           |                  |                                                                                |

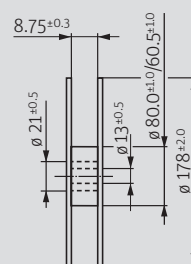
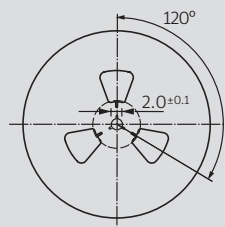
# Oscillator JR032 • 32.768 kHz

## TAPING SPECIFICATION



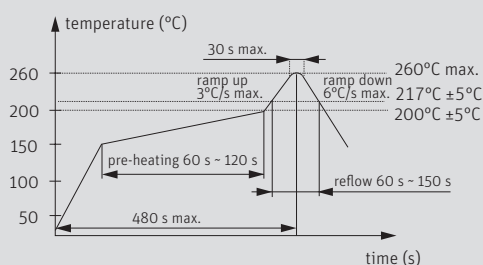
500 pcs per reel

Feeding



in mm

## REFLOW SOLDERING PROFILE



note: parts are also suitable for soldering systems with lead (Pb) content

## MARKING

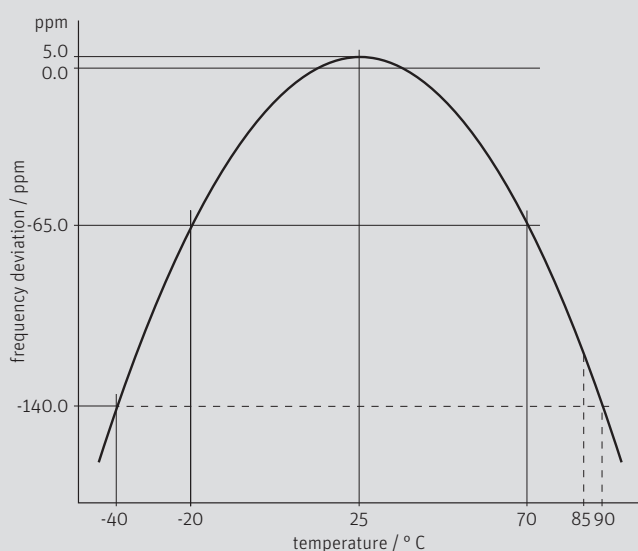
### frequency / date code

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