



actual size

MEMS TCXO · JSO TR · 32.768kHz

- ultra-stable 32.768 kHz clock source
- ultra-small CSP package 1.5 x 0.8 mm
- very short start-up time
- can replace tuning fork crystals
- wide supply voltage range 1.5 V ~ 3.63 V
- very low current consumption



RoHS compliant



Pb free



REACH compliant



Conflict mineral free

GENERAL DATA

TYPE		JSO15B1TR
supply voltage V_{DC}	1.5 V ~ 3.63 V	
current consumption typ.	1.2 μ A (rail-to-rail mode, no load, VDC = 1.8 V)	
output frequency	32.768 kHz	
frequency stability vs. temp.	± 10 ppm ~ ± 22 ppm (see table 1)	
frequency stability vs. voltage	± 0.75 ppm at 1.8 V ± 0.18 V	
	± 1.5 ppm at 1.5 V ~ 3.63 V	
aging	at +25°C	± 1 ppm first year
temperature	operating	0°C ~ +70°C / -40°C ~ +85°C
	storage	-50°C ~ +125°C
output	low level max.	0.1 x V_{DC}
	high level min.	0.9 x V_{DC}
	load max.	15 pF
	current max.	1.0 μ A
	rise & fall time	200 ns max. (15 pF, 10 \leftrightarrow 90 %)
		50 ns max. (5 pF, 10 \leftrightarrow 90 %)
start-up time max.	400 ms	
power supply ramp max.	100 ms	
period jitter RMS typ.	35 ns	

TABLE 1: FREQUENCY STABILITY CODE

stability code / temp. code including frequency tolerance* excluding frequency tolerance**		D	K	F
		± 22 ppm	± 13 ppm	± 10 ppm
		± 20 ppm	± 10 ppm	± 5 ppm
0°C ~ +70°C	T0	○	○	○
-40°C ~ +85°C	T1	○	○	○

○ available

* includes tolerance at 25°C and frequency stability in operating temp. range.

** frequency stability in operating temp. range, frequency tolerance excluded.

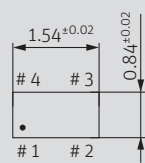
TABLE 2: CURRENT CONSUMPTION TYP. (FOR MAX. ADD 40%)

supply current at load	none	5 pF	10 pF	15 pF	unit
at startup (150 ms max.)	30.0				μ A
during temp. compensation*	6.0				μ A
$V_{RR} = 1.80$ V, compensation inactive	1.2	1.5	1.8	2.1	μ A
$V_{RR} = 2.50$ V, compensation inactive	1.3	1.7	2.0	2.5	μ A
$V_{RR} = 3.30$ V, compensation inactive	1.4	1.9	2.5	3.0	μ A

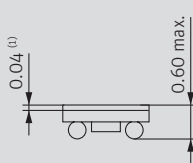
* repetitive temp. compensation consuming 6 μ A for 10 ms, repeating every 350 ms

[More information about the features of the JSO TR 32.768 kHz TCXO can be found here.](#)

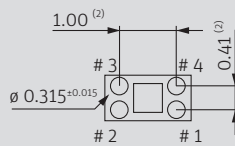
DIMENSIONS



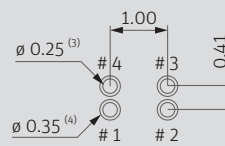
top view



side view



bottom view



pad layout

in mm

pin connection

- #1: GND
- #2: output
- #3: V_{DC}
- #4: GND

- (1) polymer coating thickness
- (2) basic spacing between centers
- (3) non-solder mask defined pads
- (4) soldermask opening diameter

PACKAGING NOTE

QTY < 250 pcs. → cut tape
 QTY 250/500/1K/3K → tape and reel
 Marking: identifier for pin 1

PIN CONNECTION



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ORDER INFORMATION

EXAMPLE

O 0.032768 - JSO 15 B1 T R - F - 1V3 - T0 - R R - D

O = Oscillator
frequency
JSO = Jauch Silicon Oscillator
package
15 = 1.5 x 0.8 mm CSP
version/revision
function/feature
T = TCXO
usage
R = for RTC (real time clock)

DC coupling:
D = DC
output:
RR = rail-to-rail
temperature range
T0 = 0°C ~ +70°C
T1 = -40°C ~ +85°C
see table 1
supply voltage
1V3 = variable supply voltage
1.5 V ~ 3.63 V
frequency stability
F = ±5 ppm
K = ±10 ppm
D = ±20 ppm
see table 1

NOTE

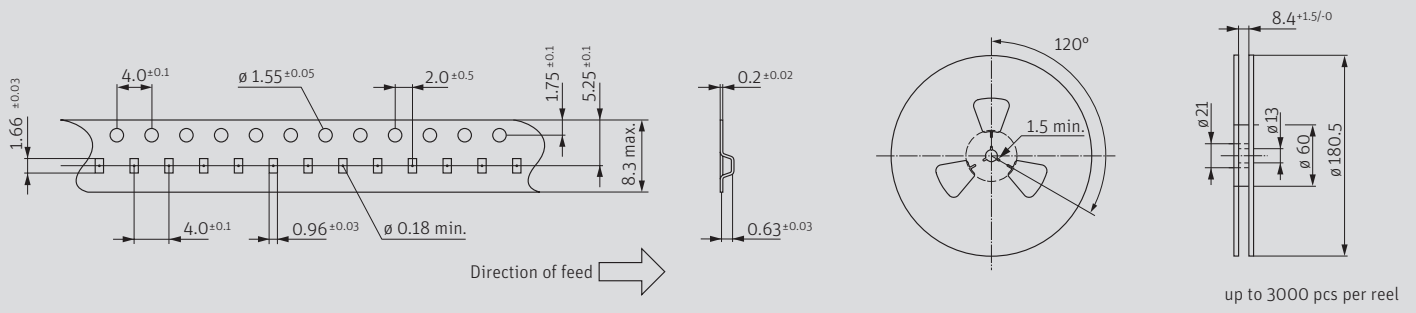
Standard type O 0.032768-JSO15B1TR-F-1V3-T1-RR-D typically available from stock.

Frequency stability (table 1): F = ±5 ppm

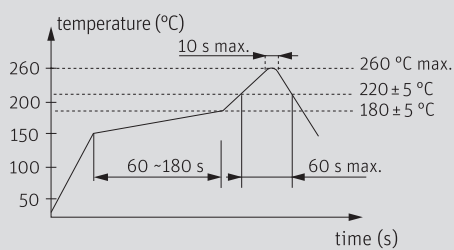
Operating temperature range: T1 = -40°C ~ +85°C

Supply voltage: 1V3 = 1.5 V ~ 3.63 V variable

TAPING SPECIFICATION



REFLOW SOLDERING PROFILE



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