

# MEMS OSCILLATORS

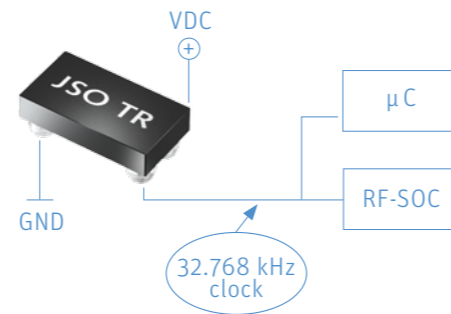
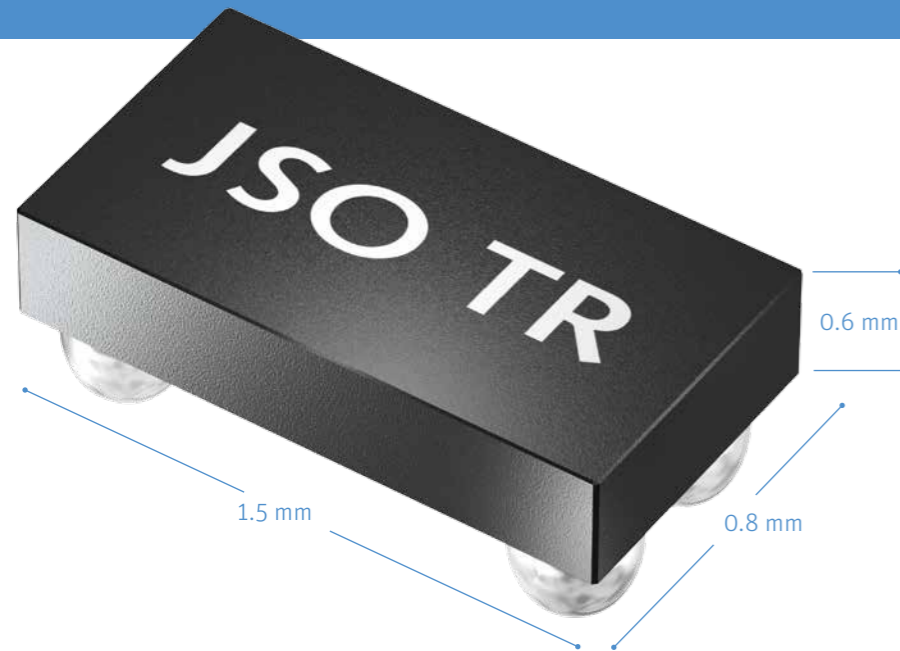


› MEMS Oscillators

# JS015 TR

HIGHEST ACCURACY FOR RTC APPLICATIONS

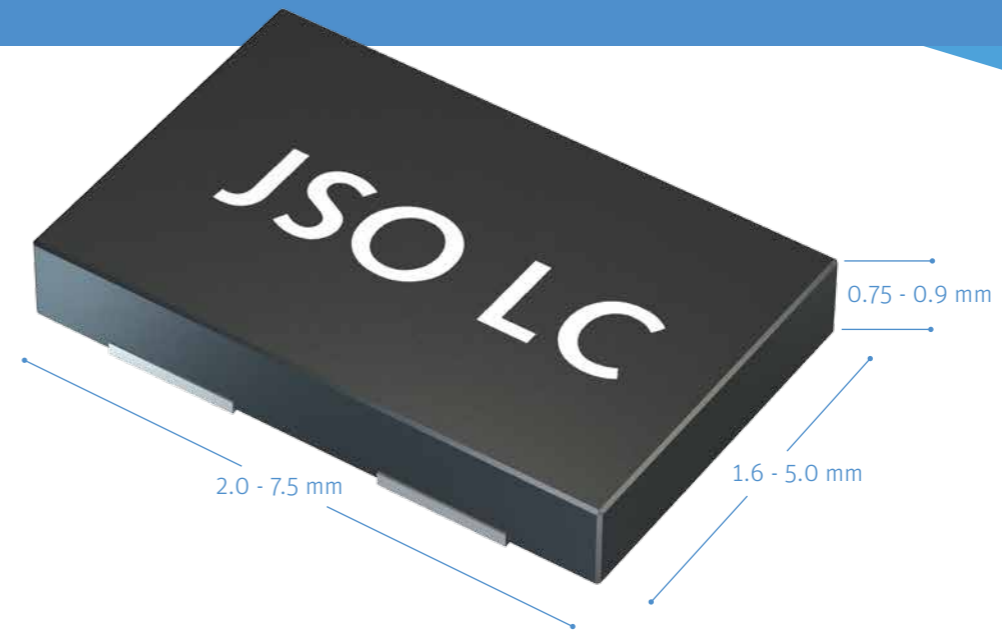
32.768 kHz



# JSO LC SERIES

LOW POWER FOR VERSATILE APPLICATIONS

1 MHz - 137 MHz



## PRODUCT FEATURES

- › Temperature compensated MEMS oscillator (TCXO)
- › Output frequency 32.768 kHz
- › Best temperature stability  $\pm 5$  ppm
- › Temperature range  $-40^{\circ}\text{C} \sim +85^{\circ}\text{C}$
- › Variable supply voltage range 1.5 Volt  $\sim$  3.63 Volt
- › CSP 1.5 x 0.8 x 0.6 (chip scale package)
- › High shock and vibration resistance
- › Extremely high reliability

## APPLICATIONS

- › Highly accurate Real Time Clocks (RTC)
- › Smart Meters / Automated Meter Reading (AMR)
- › Wearables / Activity Trackers / Smart Watches
- › Mobile Medical Instruments
- › Health and Wellness Monitors
- › Tablets / Mobile Phones

## ADDITIONAL SERVICES

- › Samples of JS015 TR typically available from stock
- › Free samples shipped within 48 hours
- › Technical customer support by field application engineers

## PRODUCT FEATURES

- › Silicon MEMS resonator based oscillators
- › Frequency range 1 MHz  $\sim$  137 MHz
- › Best temperature stability  $\pm 20$  ppm
- › Widest temperature range  $-55^{\circ}\text{C} \sim +125^{\circ}\text{C}$
- › Supply voltage range 1.8 Volt  $\sim$  3.3 Volt
- › Compatible to all standard oscillator packages and pad layouts
- › 50,000 G shock and 70 G vibration resistance
- › Extremely high reliability

## DROP-IN REPLACEMENT FOR THE FOLLOWING PACKAGES

- › 2016 (2.0 x 1.6 x 0.75 mm)
- › 2520 (2.5 x 2.0 x 0.75 mm)
- › 3225 (3.2 x 2.5 x 0.75 mm)
- › 5032 (5.0 x 3.2 x 0.75 mm)
- › 7050 (7.5 x 5.0 x 0.90 mm)

## ADDITIONAL SERVICES

- › Local configuration center in Germany
- › Technical customer support by field application engineers
- › Free samples shipped within 48 hours

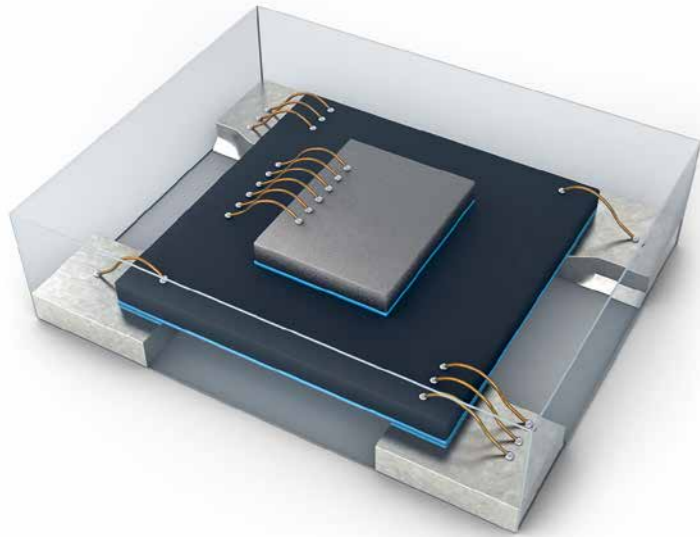
**NEW AT JAUCH:** TEMPERATURE COMPENSATED MEMS OSCILLATORS  
**EASY TO USE:** JUST CONNECT VDC, FEED MULTIPLE CLOCK RECEIVERS

**NEW AT JAUCH:** MEMS OSCILLATORS  
**EASY TO CONFIGURE:** CHECK OUT OUR WEBSITE



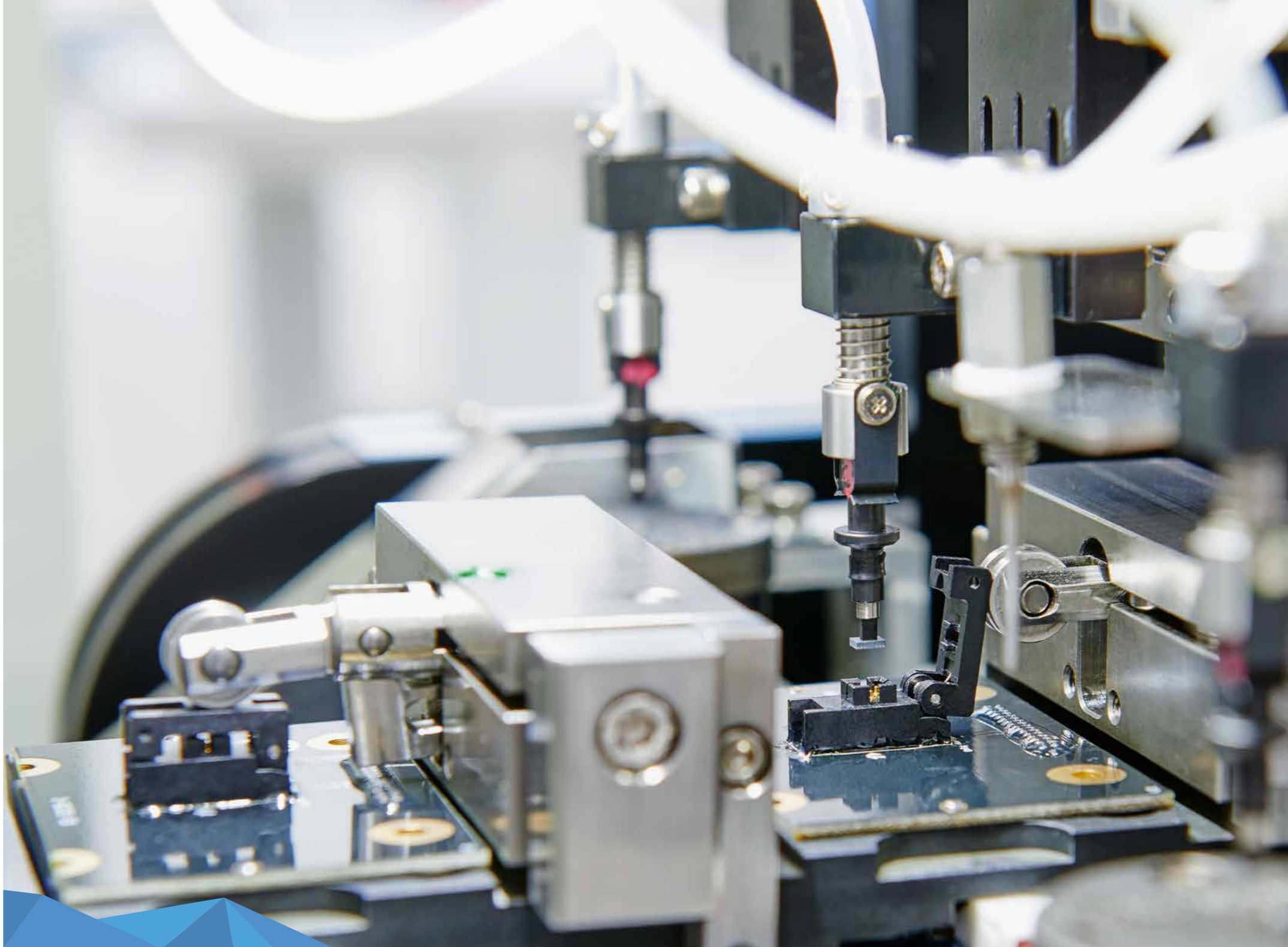
## CUSTOMIZED AND CONFIGURABLE

MEMS oscillators use a silicon resonator, instead of a silicon dioxide resonator which is used in quartz crystal oscillators. MEMS oscillators are produced in semiconductor factories, as this ensures a constant high quality of the components. At our headquarters in Germany, the MEMS oscillators are configured to your specifications and can be shipped within 48 hours. Thanks to the rapid availability of products, it is possible to make last-minute changes to design-in. This enables developers to have a high degree of flexibility for their current project.



### THE MEMS ADVANTAGE – CONFIGURED BY US TO YOUR SPECIFICATIONS

- ▶ Extremely high impact, shock and vibration resistance: 50,000 g of shock and 70 g of vibration
- ▶ Wide operating temperature range: -55°C to +125°C
- ▶ High frequency stability over the entire operating temperature range:  $\pm 20$  ppm
- ▶ 100% drop-in replacement for standard QFN packages 2016, 2520, 3225, 5032 and 7050 (QFN = Quad Flatpack No-Lead)
- ▶ Extremely reliable thanks to the semiconductor manufacturing process



### »» Fast delivery service

You can order samples of MEMS oscillators for free from Jauch. We configure the MEMS oscillators according to your requirements and can ship within 48 hours.





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

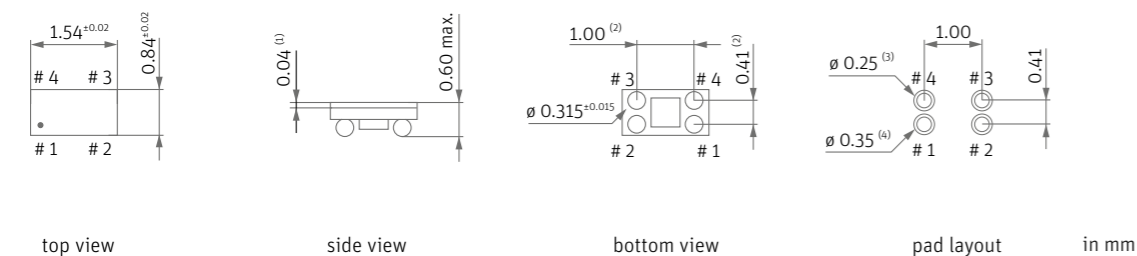


## GENERAL DATA

TYPE		JSO15B1TR
supply voltage $V_{DC}$		1.5 V ~ 3.63 V
current consumption typ.		1.2 $\mu$ A (rail-to-rail mode, no load, VDC = 1.8 V)
output frequency		32.768 kHz
frequency stability vs. temp.		$\pm 10$ ppm ~ $\pm 22$ ppm (see table 1)
frequency stability vs. voltage		$\pm 0.75$ ppm at 1.8 V $\pm 0.18$ V $\pm 1.5$ ppm at 1.5 V ~ 3.63 V
aging	at +25°C	$\pm 1$ ppm first year
temperature	operating	0°C ~ +70°C / -40°C ~ +85°C
	storage	-50°C ~ +125°C
output	low level max.	$0.1 \times V_{DC}$
	high level min.	$0.9 \times V_{DC}$
	load max.	15 pF
	current max.	1.0 $\mu$ 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

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

## DIMENSIONS



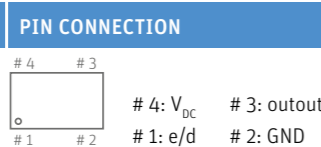
pin connection

- #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

## PACKING NOTE / MARKING

QTY < 250 pcs. → cut tape  
QTY 250/500/1K/3K pcs. → tape and reel  
Marking: lot code only



## TABLE 1: FREQUENCY STABILITY CODE

stability code / temp. code including frequency tolerance* excluding frequency tolerance**	D	K	F
0°C ~ +70°C	T0	0	0
-40°C ~ +85°C	T1	0	0
0 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				$\mu$ A
during temp. compensation*	6.0				$\mu$ A
$V_{RR} = 1.80$ V, compensation inactive	1.2	1.5	1.8	2.1	$\mu$ A
$V_{RR} = 2.50$ V, compensation inactive	1.3	1.7	2.0	2.5	$\mu$ A
$V_{RR} = 3.30$ V, compensation inactive	1.4	1.9	2.5	3.0	$\mu$ A

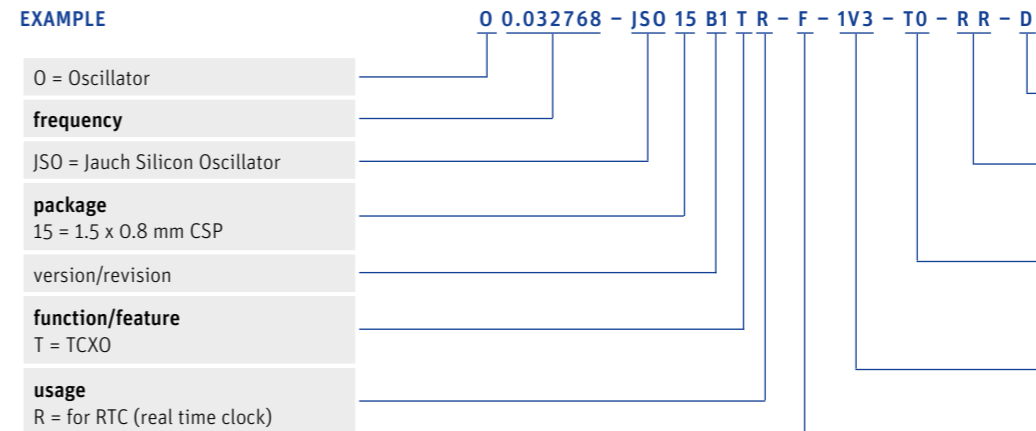
\* repetitive temp. compensation consuming 6  $\mu$ A for 10 ms, repeating every 350 ms

# MEMS TCXO · JSO TR · 32.768kHz



## ORDER INFORMATION

### EXAMPLE



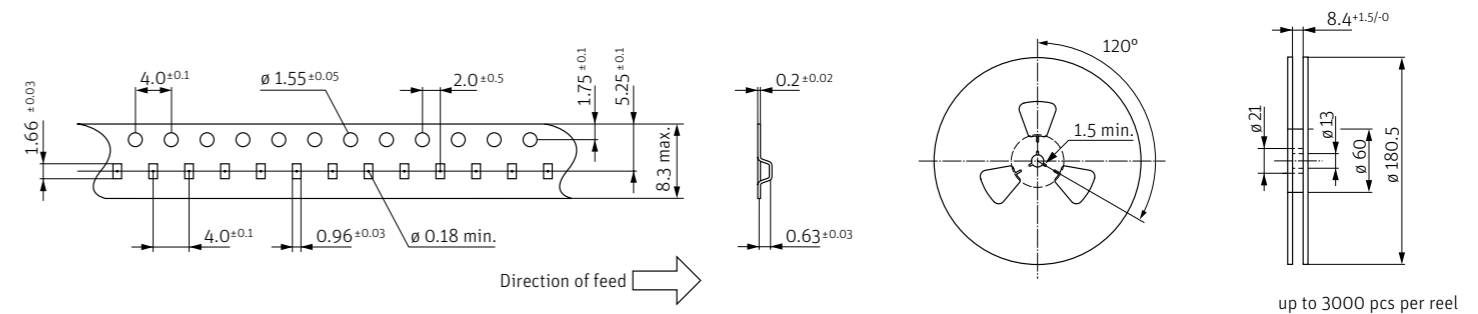
- DC coupling:**  
D = DC
- output:**  
R R = rail-to-rail
- temperature range**  
T0 = 0°C ~ +70°C  
T1 = -40°C ~ +85°C  
see table 1
- supply voltage**  
1V3 = variable supply voltage  
1.5 V ~ 3.63 V
- frequency stability**  
F =  $\pm 5$  ppm  
K =  $\pm 10$  ppm  
D =  $\pm 20$  ppm  
see table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

## NOTE

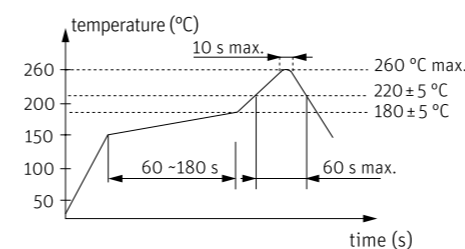
Standard type **O 0.032768-JSO15B1TR-F-1V3-T1-RR-D** typically available from stock.

Frequency stability (table 1): F =  $\pm 5$  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.

10|2016





# MEMS Oscillator · JSO LC series · 1.8 V

- ▶ low power oscillator with HCMOS/LVCMOS output
- ▶ compatible to industry standard packages 2016 – 7050
- ▶ configured to customer's specification
- ▶ extended shock & vibration resistance
- ▶ very fast delivery service



actual size    2016    2520    3225    5032    7050

GENERAL DATA		
TYPE	JSOxxCxLC 1.8 V	
frequency range	1.0 ~ 110.0 MHz (temp. range T0 ~ T8)	
	115.0 ~ 137.0 MHz (temp. range T0 ~ T1)	
frequency stability over all	±20 ppm ~ ±50 ppm (see table 1)	
current consumption	see table 2	
supply voltage V <sub>DC</sub>	1.8 V ± 10%	
temperature	operating	
	T0 = -20°C ~ +70°C	
	T1 = -40°C ~ +85°C	
	T2 = -40°C ~ +105°C	
	T3 = -40°C ~ +125°C	
T8 = -55°C ~ +125°C		
storage	-55°C ~ +150°C	
output	logic	HCMOS/LVCMOS
	rise & fall time	4.2 ns max. at 15 pF / 6.8 ns max. at 30 pF (see table 4)
	load max.	30 pF max. recommended (≤74.0 MHz)
		15 pF max. recommended (≤74.0 MHz)
		other load capacitances possible, see supplementary <a href="#">document</a>
	current max.	2 mA
low level max.	0.1 x V <sub>DC</sub>	
high level min.	0.9 x V <sub>DC</sub>	
standby function (e/d)	stop (S), tristate-only (T) or none (N), see table 3	
output disable time max.	150 ns	
start-up time max.	5 ms	
standby current max.	2 µA (for stop (S), see table 3)	
phase jitter 12 kHz ~ 20 MHz	< 3.0 ps RMS	
symmetry at 0.5 x VDC	45% ~ 55% (standard)	

note: some frequencies can't be configured, see table 5.

TABLE 1: FREQUENCY STABILITY CODE					
stability code / temp. code*		B	G	C	D
		±50 ppm	±30 ppm	±25 ppm	±20 ppm
-20°C ~ +70°C	T0	0	0	0	0
-40°C ~ +85°C	T1	0	0	0	0
-40°C ~ +105°C	T2	0	0	0	0
-40°C ~ +125°C	T3	0	0	0	0
-55°C ~ +125°C	T8	0	0	0	0
0 available					

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

TABLE 2: CURRENT CONSUMPTION TYP. (FOR MAX. ADD 30%)					
current at load	5 pF	15 pF	30 pF	15 pF	unit
output disabled	3.5	3.5	3.5	3.5	mA
1.0 ~ 19.9 MHz	3.6	3.9	4.4	5.5	mA
20.0 ~ 29.9 MHz	4.2	4.5	5.4	6.5	mA
30.0 ~ 49.9 MHz	4.5	5.1	6.5		mA
50.0 ~ 79.9 MHz	4.9	6.3			mA
80.0 ~ 110.0 MHz	5.7	7.6			mA
115.0 ~ 137.0 MHz	(8.0)	(13.0)			mA

note: current at default edge control setting "D", also refer to table 4.

TABLE 3: CONFIGURABLE STANDBY FUNCTION OPTIONS (E/D)		
pin #1 (e/d control)	option	functionality
low "0" (V <sub>IL</sub> ≤ 0.2 V <sub>DC</sub> )	S = Stop	output weakly pulled down, oscillator in sleep mode
	T = TriState	output high impedance, oscillator operates
	N = None	oscillator output active
high "1" (V <sub>IH</sub> ≥ 0.8 V <sub>DC</sub> )	all	oscillator output active
open*	all	oscillator output active

\* a pull up resistor is recommended in EMI stressed circuit environments.

PACKING NOTE / MARKING	PIN CONNECTION
QTY < 250 pcs. → cut tape	
QTY 250/500/1K/3K pcs. → tape and reel	
Marking: lot code only	

RoHS compliant

Pb free

REACH compliant

Conflict mineral free

Jauch MEMS – Uses SiTime's MEMS First™ technology

# MEMS Oscillator · JSO LC series · 1.8 V



TABLE 4: MAX. RISE & FALL TIME VS. LOAD CAPACITANCE

C <sub>L</sub>	5 pF	15 pF	30 pF	5 pF	15 pF	30 pF
edge control	at 10% ~ 90% of V <sub>DC</sub> (ns)			at 20% ~ 80% of V <sub>DC</sub> (ns)		
D = 0*	1.8	4.2	6.8	1.2	2.8	4.8
1	2.2	5.0	7.6	1.4	3.4	5.2
2	2.4	5.6	8.8	1.6	3.8	6.0
3	2.8	6.0	10.0	1.8	4.2	6.8
4	4.8	9.8	17.0	3.4	6.6	11.6
5	6.6	12.6	21.0	4.4	8.6	15.0
6	10.0	18.0	32.0	6.6	12.0	22.0
7	18.0	34.0	62.0	12.4	24.0	44.0

\* default edge control setting "D" at VDC = 1.8 V, please also refer to the supplementary information [on our homepage](#) for typical values and more details.

TABLE 5: NON-CONFIGURABLE FREQUENCIES

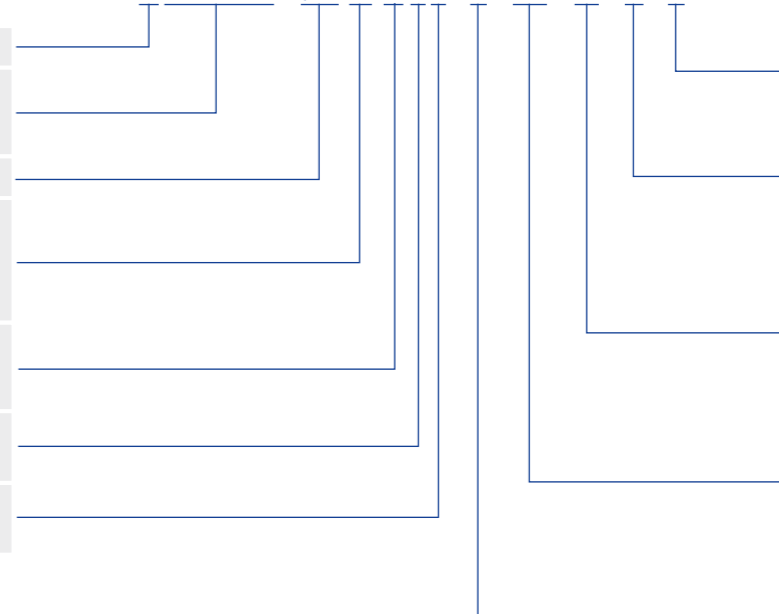
operating temperature option		operating temperature option	
T2 - (-40°C ~ +105°C)		T8 - (-55°C ~ +125°C)	
T3 - (-40°C ~ +125°C)			
from (MHz)	to (MHz)	from (MHz)	to (MHz)
61.223	61.674	61.223	61.974
69.796	70.485	69.240	70.827
79.063	79.162	78.715	79.561
81.428	82.232	80.160	80.174
91.834	92.155	80.780	82.632
94.249	94.430	91.834	95.474
94.875	94.994	96.192	96.209
97.714	98.679	96.936	99.158
110.0	115.194	110.0	119.342
117.811	118.038	-	-
118.594	118.743	120.239	120.262
122.142	122.705	121.170	121.243
123.022	123.348	121.601	123.948

## ORDER INFORMATION

### EXAMPLE

0 = Oscillator  
**frequency (8 digits), see also table 5**  
 1.0 ~ 110.0 MHz  
 115.0 ~ 137.0 MHz  
 JSO = Jauch Silicon Oscillator  
**package**  
 75 = 7050    22 = 2520  
 53 = 5032    21 = 2016  
 32 = 3225  
**frequency range**  
 C1 = 1.0 ~ 110.0 MHz  
 C2 = 115.0 ~ 137.0 MHz  
**function/feature**  
 L = lowpower  
**output I/F**  
 C = (H)CMOS

0 26.123456 - JSO 75 C1 L C - B - 1.8 - T0 - S - D



- edge control**  
D = default  
0 ~ 7, see table 4
- standby function options**  
S = Stop  
T = TriState  
N = None
- temperature range**  
T0 = -20°C ~ + 70°C  
T1 = -40°C ~ + 85°C  
T2 = -40°C ~ +105°C  
T3 = -40°C ~ +125°C  
T8 = -55°C ~ +125°C
- supply voltage**  
3.3 = 3.3 V    2.5 = 2.5 V  
3.0 = 3.0 V    1.8 = 1.8 V  
2.8 = 2.8 V    2V3 = 2.5 V ~ 3.3 V
- frequency stability overall**  
B = ± 50 ppm  
G = ± 30 ppm  
C = ± 25 ppm  
D = ± 20 ppm



# MEMS Oscillator · JSO LC series · 2.5 V

- ▶ low power oscillator with HCMOS/LVCMOS output
- ▶ compatible to industry standard packages 2016 – 7050
- ▶ configured to customer's specification
- ▶ extended shock & vibration resistance
- ▶ very fast delivery service



actual size    2016    2520    3225    5032    7050

GENERAL DATA		
TYPE	JSOxxCxLC 2.5 V	
frequency range	1.0 ~ 110.0 MHz (temp. range T0 ~ T8) 115.0 ~ 137.0 MHz (temp. range T0 ~ T1)	
frequency stability over all	±20 ppm ~ ±50 ppm (see table 1)	
current consumption	see table 2	
supply voltage V <sub>DC</sub>	2.5 V ± 10%	
temperature	operating	
	T0 = -20°C ~ +70°C	
	T1 = -40°C ~ +85°C	
	T2 = -40°C ~ +105°C	
	T3 = -40°C ~ +125°C	
T8 = -55°C ~ +125°C		
storage	-55°C ~ +150°C	
output	logic	HCMOS/LVCMOS
	rise & fall time	3.0 ns max. at 15 pF / 6.0 ns max. at 30 pF (see table 4)
	load max.	30 pF max. recommended (≤83.0 MHz)
		15 pF max. recommended (≤83.0 MHz)
	other load capacitances possible, see supplementary <a href="#">document</a>	
	current max.	3 mA
low level max.	0.1 x V <sub>DC</sub>	
high level min.	0.9 x V <sub>DC</sub>	
standby function (e/d)	stop (S), tristate-only (T) or none (N), see table 3	
output enable time max.	5 ms (S) / 150 ns (T)	
output disable time max.	150 ns	
start-up time max.	5 ms	
standby current max.	3 µA (for stop (S), see table 3)	
phase jitter 12 kHz ~ 20 MHz	< 3.0 ps RMS	
symmetry at 0.5 x V <sub>DC</sub>	45% ~ 55% (standard)	

note: some frequencies can't be configured, see table 5.

PACKING NOTE / MARKING	PIN CONNECTION
QTY < 250 pcs. → cut tape	
QTY 250/500/1K/3K pcs. → tape and reel	
Marking: lot code only	
	# 4: V <sub>DC</sub> # 3: output
	# 1: e/d    # 2: GND

TABLE 1: FREQUENCY STABILITY CODE					
stability code / temp. code*		B	G	C	D
		±50 ppm	±30 ppm	±25 ppm	±20 ppm
-20°C ~ +70°C	T0	0	0	0	0
-40°C ~ +85°C	T1	0	0	0	0
-40°C ~ +105°C	T2	0	0	0	0
-40°C ~ +125°C	T3	0	0	0	0
-55°C ~ +125°C	T8	0	0	0	0
0 available					

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

TABLE 2: CURRENT CONSUMPTION TYP. (FOR MAX. ADD 30%)					
current at load	5 pF	15 pF	30 pF	60 pF	unit
output disabled	3.7	3.7	3.7	3.7	mA
1.0 ~ 19.9 MHz	3.8	4.2	5.0	6.4	mA
20.0 ~ 29.9 MHz	4.3	5.0	6.4	9.0	mA
30.0 ~ 49.9 MHz	4.7	5.8	7.8	11.6	mA
50.0 ~ 79.9 MHz	5.6	7.6	10.7		mA
80.0 ~ 110.0 MHz	6.6	9.2			mA
115.0 ~ 137.0 MHz	(8.5)	(13.0)			mA

note: current at default edge control setting "D", also refer to table 4.

TABLE 3: CONFIGURABLE STANDBY FUNCTION OPTIONS (E/D)		
pin #1 (e/d control)	option	functionality
low "0" (V <sub>IL</sub> ≤ 0.2 V <sub>DC</sub> )	S = Stop	output weakly pulled down, oscillator in sleep mode
	T = TriState	output high impedance, oscillator operates
	N = None	oscillator output active
high "1" (V <sub>IH</sub> ≥ 0.8 V <sub>DC</sub> )	all	oscillator output active
open*	all	oscillator output active

\* a pull up resistor is recommended in EMI stressed circuit environments.

RoHS compliant

Pb free

REACH compliant

Conflict mineral free

Jauch MEMS – Uses SiTime's MEMS First™ technology

# MEMS Oscillator · JSO LC series · 2.5 V



TABLE 4: MAX. RISE & FALL TIME VS. LOAD CAPACITANCE

C <sub>L</sub>	5 pF	15 pF	30 pF	5 pF	15 pF	30 pF
edge control	at 10% ~ 90% of V <sub>DC</sub> (ns)			at 20% ~ 80% of V <sub>DC</sub> (ns)		
0	1.2	2.4	5.2	0.8	1.7	3.4
1	1.4	2.6	5.8	0.9	1.9	3.8
D=2*	1.6	3.0	6.0	1.1	2.1	4.0
3	1.8	4.0	6.6	1.2	2.6	4.6
4	3.2	6.4	11.0	2.2	4.4	7.8
5	4.4	8.4	14.6	2.9	5.8	10.4
6	6.6	12.4	23.0	4.4	8.6	15.2
7	12.8	25.0	46.0	8.6	16.6	30.0

\* default edge control setting "D" at V<sub>DC</sub> = 2.5 V, please also refer to the supplementary information [on our homepage](#) for typical values and more details.

TABLE 5: NON-CONFIGURABLE FREQUENCIES

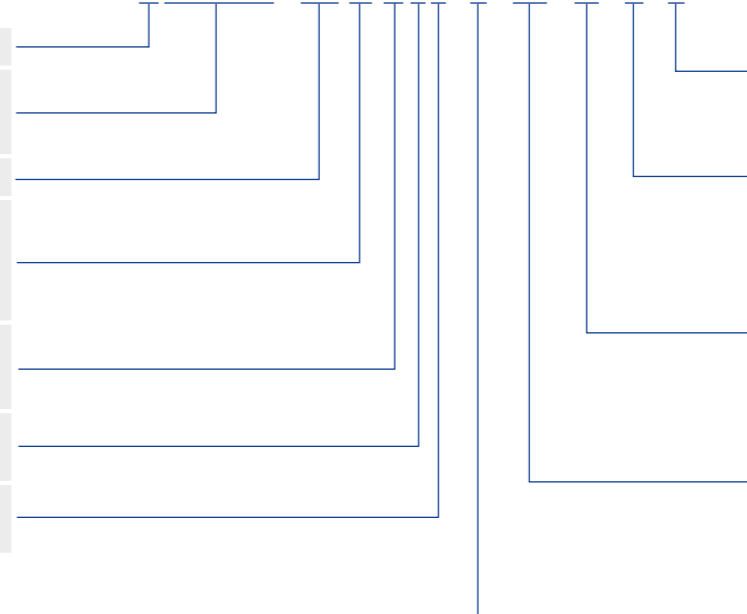
operating temperature option		operating temperature option	
T2 (-40°C ~ +105°C)		T8 (-55°C ~ +125°C)	
T3 (-40°C ~ +125°C)			
from (MHz)	to (MHz)	from (MHz)	to (MHz)
61.223	61.674	61.223	61.974
69.796	70.485	69.240	70.827
79.063	79.162	78.715	79.561
81.428	82.232	80.160	80.174
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94.249	94.430	91.834	95.474
94.875	94.994	96.192	96.209
97.714	98.679	96.936	99.158
110.0	115.194	110.0	119.342
117.811	118.038	-	-
118.594	118.743	120.239	120.262
122.142	122.705	121.170	121.243
123.022	123.348	121.601	123.948

## ORDER INFORMATION

### EXAMPLE

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**frequency (8 digits, see also table 5)**  
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**package**  
 75 = 7050    22 = 2520  
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 32 = 3225  
**frequency range**  
 C1 = 1.0 ~ 110.0 MHz  
 C2 = 115.0 ~ 137.0 MHz  
**function/feature**  
 L = lowpower  
**output I/F**  
 C = (H)CMOS

O 26.123456 - JSO 75 C1 L C - B - 2.5 - T0 - S - D



- edge control**  
D = default  
0 ~ 7, see table 4
- standby function options**  
S = Stop  
T = TriState  
N = None
- temperature range**  
T0 = -20°C ~ +70°C  
T1 = -40°C ~ +85°C  
T2 = -40°C ~ +105°C  
T3 = -40°C ~ +125°C  
T8 = -55°C ~ +125°C
- supply voltage**  
3.3 = 3.3 V    2.5 = 2.5 V  
3.0 = 3.0 V    1.8 = 1.8 V  
2.8 = 2.8 V    2V3 = 2.5 V ~ 3.3 V
- frequency stability overall**  
B = ± 50 ppm  
G = ± 30 ppm  
C = ± 25 ppm  
D = ± 20 ppm



# MEMS Oscillator · JSO LC series · 2.8 V

- ▶ low power oscillator with HCMOS/LVCMOS output
- ▶ compatible to industry standard packages 2016 – 7050
- ▶ configured to customer's specification
- ▶ extended shock & vibration resistance
- ▶ very fast delivery service



actual size    2016    2520    3225    5032    7050

GENERAL DATA		
TYPE	JSOxxCxLC 2.8 V	
frequency range	1.0 ~ 110.0 MHz (temp. range T0 ~ T8) 115.0 ~ 137.0 MHz (temp. range T0 ~ T1)	
frequency stability over all	±20 ppm ~ ±50 ppm (see table 1)	
current consumption	see table 2	
supply voltage V <sub>DC</sub>	2.8 V ± 10%	
temperature	operating	
	T0 = -20°C ~ +70°C	
	T1 = -40°C ~ +85°C	
	T2 = -40°C ~ +105°C	
	T3 = -40°C ~ +125°C	
T8 = -55°C ~ +125°C		
storage	-55°C ~ +150°C	
output	logic	HCMOS/LVCMOS
	rise & fall time	2.9 ns max. at 15 pF / 5.7 ns max. at 30 pF (see table 4)
	load max.	30 pF max. recommended (≤88.0 MHz)
		15 pF max. recommended (≤88.0 MHz)
	other load capacitances possible, see supplementary <a href="#">document</a>	
	current max.	3 mA
low level max.	0.1 x V <sub>DC</sub>	
high level min.	0.9 x V <sub>DC</sub>	
standby function (e/d)	stop (S), tristate-only (T) or none (N), see table 3	
output enable time max.	5 ms (S) / 150 ns (T)	
output disable time max.	150 ns	
start-up time max.	5 ms	
standby current max.	4 µA (for stop (S), see table 3)	
phase jitter 12 kHz ~ 20 MHz	< 3.0 ps RMS	
symmetry at 0.5 x V <sub>DC</sub>	45% ~ 55% (standard)	

note: some frequencies can't be configured, see table 5.

PACKING NOTE / MARKING	PIN CONNECTION
QTY < 250 pcs. → cut tape	
QTY 250/500/1K/3K pcs. → tape and reel	
Marking: lot code only	
	# 4: V <sub>DC</sub> # 3: output
	# 1: e/d    # 2: GND

TABLE 1: FREQUENCY STABILITY CODE					
stability code / temp. code*		B	G	C	D
		±50 ppm	±30 ppm	±25 ppm	±20 ppm
-20°C ~ +70°C	T0	0	0	0	0
-40°C ~ +85°C	T1	0	0	0	0
-40°C ~ +105°C	T2	0	0	0	0
-40°C ~ +125°C	T3	0	0	0	0
-55°C ~ +125°C	T8	0	0	0	0
0 available					

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

TABLE 2: CURRENT CONSUMPTION TYP. (FOR MAX. ADD 30%)					
current at load	5 pF	15 pF	30 pF	60 pF	unit
output disabled	3.8	3.8	3.8	3.8	mA
1.0 ~ 19.9 MHz	4.1	4.3	5.2	6.9	mA
20.0 ~ 29.9 MHz	4.4	5.2	6.7	9.8	mA
30.0 ~ 49.9 MHz	4.8	6.2	8.3	12.7	mA
50.0 ~ 79.9 MHz	6.1	8.1	11.7		mA
80.0 ~ 110.0 MHz	7.0	10.0			mA
115.0 ~ 137.0 MHz	(9.0)	(14.0)			mA

note: current at default edge control setting "D", also refer to table 4.

TABLE 3: CONFIGURABLE STANDBY FUNCTION OPTIONS (E/D)		
pin #1 (e/d control)	option	functionality
low "0" (V <sub>IL</sub> ≤ 0.2 V <sub>DC</sub> )	S = Stop	output weakly pulled down, oscillator in sleep mode
	T = TriState	output high impedance, oscillator operates
	N = None	oscillator output active
high "1" (V <sub>IH</sub> ≥ 0.8 V <sub>DC</sub> )	all	oscillator output active
open*	all	oscillator output active

\* a pull up resistor is recommended in EMI stressed circuit environments.

RoHS compliant

Pb free

REACH compliant

Conflict mineral free

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# MEMS Oscillator · JSO LC series · 2.8 V



TABLE 4: MAX. RISE & FALL TIME VS. LOAD CAPACITANCE

C <sub>L</sub>	5 pF	15 pF	30 pF	5 pF	15 pF	30 pF
edge control	at 10% ~ 90% of V <sub>DC</sub> (ns)			at 20% ~ 80% of V <sub>DC</sub> (ns)		
0	1.2	2.2	4.6	0.8	1.6	3.0
1	1.3	2.4	5.2	0.9	1.8	3.5
D=2*	1.5	2.9	5.7	1.0	2.0	3.8
3	1.6	3.6	6.4	1.1	2.4	4.4
4	3.0	6.2	10.4	2.0	4.2	7.4
5	4.0	7.6	13.6	2.8	5.4	9.4
6	5.8	11.6	21.0	4.0	8.0	14.2
7	12.0	23.0	42.0	8.2	15.2	28.0

\* default edge control setting "D" at V<sub>DC</sub> = 2.8 V, please also refer to the supplementary information [on our homepage](#) for typical values and more details.

TABLE 5: NON-CONFIGURABLE FREQUENCIES

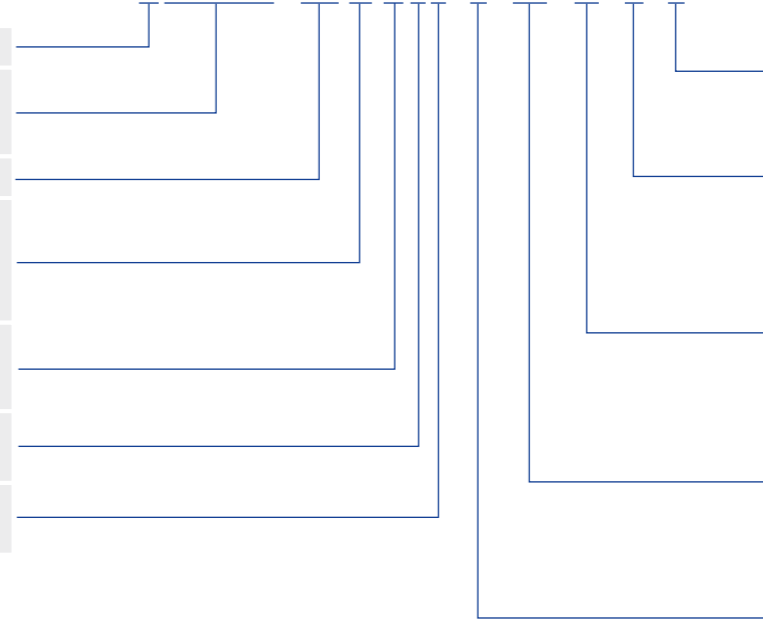
operating temperature option		operating temperature option	
T2 (-40°C ~ +105°C)		T8 (-55°C ~ +125°C)	
T3 (-40°C ~ +125°C)			
from (MHz)	to (MHz)	from (MHz)	to (MHz)
61.223	61.674	61.223	61.974
69.796	70.485	69.240	70.827
79.063	79.162	78.715	79.561
81.428	82.232	80.160	80.174
91.834	92.155	80.780	82.632
94.249	94.430	91.834	95.474
94.875	94.994	96.192	96.209
97.714	98.679	96.936	99.158
110.0	115.194	110.0	119.342
117.811	118.038	-	-
118.594	118.743	120.239	120.262
122.142	122.705	121.170	121.243
123.022	123.348	121.601	123.948

## ORDER INFORMATION

### EXAMPLE

O = Oscillator  
**frequency (8 digits, see also table 5)**  
 1.0 ~ 110.0 MHz  
 115.0 ~ 137.0 MHz  
 JSO = Jauch Silicon Oscillator  
**package**  
 75 = 7050    22 = 2520  
 53 = 5032    21 = 2016  
 32 = 3225  
**frequency range**  
 C1 = 1.0 ~ 110.0 MHz  
 C2 = 115.0 ~ 137.0 MHz  
**function/feature**  
 L = lowpower  
**output I/F**  
 C = (H)CMOS

O 26.123456 - JSO 75 C1 L C - B - 2.8 - T0 - S - D



- edge control**  
D = default  
0 ~ 7, see table 4
- standby function options**  
S = Stop  
T = TriState  
N = None
- temperature range**  
T0 = -20°C ~ +70°C  
T1 = -40°C ~ +85°C  
T2 = -40°C ~ +105°C  
T3 = -40°C ~ +125°C  
T8 = -55°C ~ +125°C
- supply voltage**  
3.3 = 3.3 V    2.5 = 2.5 V  
3.0 = 3.0 V    1.8 = 1.8 V  
2.8 = 2.8 V    2V3 = 2.5 V ~ 3.3 V
- frequency stability overall**  
B = ± 50 ppm  
G = ± 30 ppm  
C = ± 25 ppm  
D = ± 20 ppm



# MEMS Oscillator · JSO LC series · 3.0 V

- ▶ low power oscillator with HCMOS/LVCMOS output
- ▶ compatible to industry standard packages 2016 – 7050
- ▶ configured to customer's specification
- ▶ extended shock & vibration resistance
- ▶ very fast delivery service



actual size    2016    2520    3225    5032    7050

GENERAL DATA		
TYPE	JSOxxCxLC 3.0 V	
frequency range	1.0 ~ 110.0 MHz (temp. range T0 ~ T8) 115.0 ~ 137.0 MHz (temp. range T0 ~ T1)	
frequency stability over all	±20 ppm ~ ±50 ppm (see table 1)	
current consumption	see table 2	
supply voltage V <sub>DC</sub>	3.0 V ± 10%	
temperature	operating	
	T0 = -20°C ~ +70°C	
	T1 = -40°C ~ +85°C	
	T2 = -40°C ~ +105°C	
	T3 = -40°C ~ +125°C	
T8 = -55°C ~ +125°C		
storage	-55°C ~ +150°C	
output	logic	HCMOS/LVCMOS
	rise & fall time	3.3 ns max. at 15 pF / 6.2 ns max. at 30 pF (see table 4)
	load max.	30 pF max. recommended (≤81.0 MHz)
		15 pF max. recommended (≤81.0 MHz)
	other load capacitances possible, see supplementary <a href="#">document</a>	
	current max.	4 mA
low level max.	0.1 x V <sub>DC</sub>	
high level min.	0.9 x V <sub>DC</sub>	
standby function (e/d)	stop (S), tristate-only (T) or none (N), see table 3	
output enable time max.	5 ms (S) / 150 ns (T)	
output disable time max.	150 ns	
start-up time max.	5 ms	
standby current max.	5 µA (for stop (S), see table 3)	
phase jitter 12 kHz ~ 20 MHz	< 3.0 ps RMS	
symmetry at 0.5 x V <sub>DC</sub>	45% ~ 55% (standard)	

note: some frequencies can't be configured, see table 5.

PACKING NOTE / MARKING	PIN CONNECTION
QTY < 250 pcs. → cut tape	
QTY 250/500/1K/3K pcs. → tape and reel	
Marking: lot code only	

TABLE 1: FREQUENCY STABILITY CODE					
stability code / temp. code*		B	G	C	D
		±50 ppm	±30 ppm	±25 ppm	±20 ppm
-20°C ~ +70°C	T0	0	0	0	0
-40°C ~ +85°C	T1	0	0	0	0
-40°C ~ +105°C	T2	0	0	0	0
-40°C ~ +125°C	T3	0	0	0	0
-55°C ~ +125°C	T8	0	0	0	0
0 available					

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

TABLE 2: CURRENT CONSUMPTION TYP. (FOR MAX. ADD 30%)					
current at load	5 pF	15 pF	30 pF	60 pF	unit
output disabled	3.9	3.9	3.9	3.9	mA
1.0 ~ 19.9 MHz	4.1	4.5	5.4	7.2	mA
20.0 ~ 29.9 MHz	4.5	5.4	6.9	10.1	mA
30.0 ~ 49.9 MHz	4.9	6.3	8.6	13.2	mA
50.0 ~ 79.9 MHz	6.1	8.4	12.2		mA
80.0 ~ 110.0 MHz	7.3	10.5			mA
115.0 ~ 137.0 MHz	(9.5)	(14.0)			mA

note: current at default edge control setting "D", also refer to table 4.

TABLE 3: CONFIGURABLE STANDBY FUNCTION OPTIONS (E/D)		
pin #1 (e/d control)	option	functionality
low "0" (V <sub>IL</sub> ≤ 0.2 V <sub>DC</sub> )	S = Stop	output weakly pulled down, oscillator in sleep mode
	T = TriState	output high impedance, oscillator operates
	N = None	oscillator output active
high "1" (V <sub>IH</sub> ≥ 0.8 V <sub>DC</sub> )	all	oscillator output active
open*	all	oscillator output active

\* a pull up resistor is recommended in EMI stressed circuit environments.

RoHS compliant

Pb free

REACH compliant

Conflict mineral free

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# MEMS Oscillator · JSO LC series · 3.0 V



TABLE 4: MAX. RISE & FALL TIME VS. LOAD CAPACITANCE						
C <sub>L</sub>	5 pF	15 pF	30 pF	5 pF	15 pF	30 pF
edge control	at 10% ~ 90% of V <sub>DC</sub> (ns)			at 20% ~ 80% of V <sub>DC</sub> (ns)		
0	1.2	2.2	4.6	0.8	1.6	3.0
1	1.3	2.4	5.2	0.9	1.8	3.5
D=2*	1.5	2.9	5.7	1.0	2.0	3.8
3	1.6	3.6	6.4	1.1	2.4	4.4
4	3.0	6.2	10.4	2.0	4.2	7.4
5	4.0	7.6	13.6	2.8	5.4	9.4
6	5.8	11.6	21.0	4.0	8.0	14.2
7	12.0	23.0	42.0	8.2	15.2	28.0

\* default edge control setting "D" at V<sub>DC</sub> = 2.8 V, please also refer to the supplementary information [on our homepage](#) for typical values and more details.

TABLE 5: NON-CONFIGURABLE FREQUENCIES			
operating temperature option		operating temperature option	
T2 (-40°C ~ +105°C)		T8 (-55°C ~ +125°C)	
T3 (-40°C ~ +125°C)			
from (MHz)	to (MHz)	from (MHz)	to (MHz)
61.223	61.674	61.223	61.974
69.796	70.485	69.240	70.827
79.063	79.162	78.715	79.561
81.428	82.232	80.160	80.174
91.834	92.155	80.780	82.632
94.249	94.430	91.834	95.474
94.875	94.994	96.192	96.209
97.714	98.679	96.936	99.158
110.0	115.194	110.0	119.342
117.811	118.038	-	-
118.594	118.743	120.239	120.262
122.142	122.705	121.170	121.243
123.022	123.348	121.601	123.948

## ORDER INFORMATION

### EXAMPLE

O = Oscillator

**frequency (8 digits, see also table 5)**  
1.0 ~ 110.0 MHz  
115.0 ~ 137.0 MHz

JSO = Jauch Silicon Oscillator

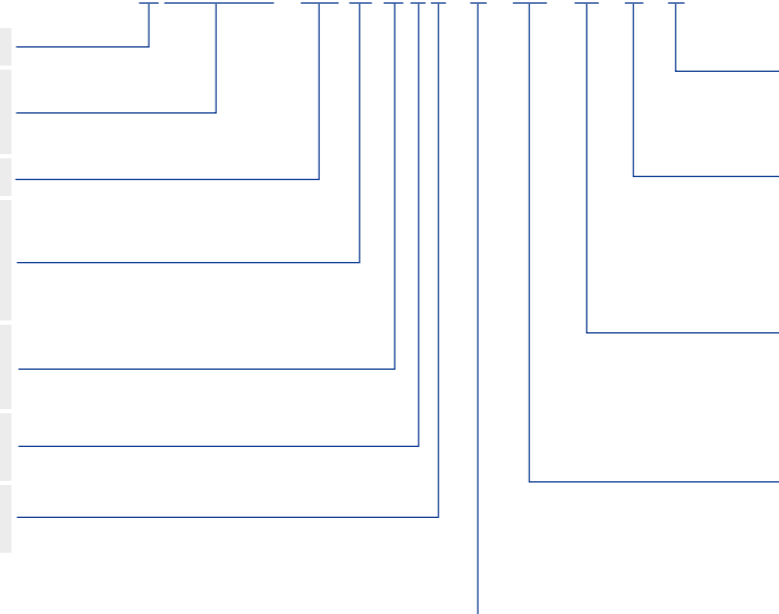
**package**  
75 = 7050      22 = 2520  
53 = 5032      21 = 2016  
32 = 3225

**frequency range**  
C1 = 1.0 ~ 110.0 MHz  
C2 = 115.0 ~ 137.0 MHz

**function/feature**  
L = lowpower

**output I/F**  
C = (H)CMOS

O 26.123456 - JSO 75 C1 L C - B - 3.0 - T0 - S - D



- edge control**  
D = default  
0 ~ 7, see table 4
- standby function options**  
S = Stop  
T = TriState  
N = None
- temperature range**  
T0 = -20°C ~ +70°C  
T1 = -40°C ~ +85°C  
T2 = -40°C ~ +105°C  
T3 = -40°C ~ +125°C  
T8 = -55°C ~ +125°C
- supply voltage**  
3.3 = 3.3 V    2.5 = 2.5 V  
3.0 = 3.0 V    1.8 = 1.8 V  
2.8 = 2.8 V    2V3 = 2.5 V ~ 3.3 V
- frequency stability overall**  
B = ± 50 ppm  
G = ± 30 ppm  
C = ± 25 ppm  
D = ± 20 ppm





# MEMS Oscillator · JSO LC series · 3.3 V

- ▶ low power oscillator with HCMOS/LVCMOS output
- ▶ compatible to industry standard packages 2016 – 7050
- ▶ configured to customer's specification
- ▶ extended shock & vibration resistance
- ▶ very fast delivery service



actual size    2016    2520    3225    5032    7050

GENERAL DATA		
TYPE	JSOxxCxLC 3.3 V	
frequency range	1.0 ~ 110.0 MHz (temp. range T0 ~ T8) 115.0 ~ 137.0 MHz (temp. range T0 ~ T1)	
frequency stability over all	±20 ppm ~ ±50 ppm (see table 1)	
current consumption	see table 2	
supply voltage V <sub>DC</sub>	3.3 V ± 10%	
temperature	operating	
	T0 = -20°C ~ +70°C	
	T1 = -40°C ~ +85°C	
	T2 = -40°C ~ +105°C	
	T3 = -40°C ~ +125°C	
T8 = -55°C ~ +125°C		
storage	-55°C ~ +150°C	
output	logic	HCMOS/LVCMOS
	rise & fall time	3 ns max. at 15 pF / 6 ns max. at 30 pF (see table 4)
	load max.	30 pF max. recommended (≤83.0 MHz)
		15 pF max. recommended (≤83.0 MHz)
	other load capacitances possible, see supplementary <a href="#">document</a>	
	current max.	4 mA
low level max.	0.1 x V <sub>DC</sub>	
high level min.	0.9 x V <sub>DC</sub>	
standby function (e/d)	stop (S), tristate-only (T) or none (N), see table 3	
output enable time max.	5 ms (S) / 150 ns (T)	
output disable time max.	150 ns	
start-up time max.	5 ms	
standby current max.	5 µA (for stop (S), see table 3)	
phase jitter 12 kHz ~ 20 MHz	< 3.0 ps RMS	
symmetry at 0.5 x V <sub>DC</sub>	45% ~ 55% (standard)	

note: some frequencies can't be configured, see table 5.

PACKING NOTE / MARKING	PIN CONNECTION
QTY < 250 pcs. → cut tape	
QTY 250/500/1K/3K pcs. → tape and reel	
Marking: lot code only	
	# 4: V <sub>DC</sub> # 3: output # 1: e/d    # 2: GND

TABLE 1: FREQUENCY STABILITY CODE					
stability code / temp. code*	B	G	C	D	
	±50 ppm	±30 ppm	±25 ppm	±20 ppm	
-20°C ~ +70°C    T0	0	0	0	0	
-40°C ~ +85°C    T1	0	0	0	0	
-40°C ~ +105°C    T2	0	0	0	0	
-40°C ~ +125°C    T3	0	0	0	0	
-55°C ~ +125°C    T8	0	0	0	0	
0 available					

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

TABLE 2: CURRENT CONSUMPTION TYP. (FOR MAX. ADD 30%)					
current at load	5 pF	15 pF	30 pF	60 pF	unit
output disabled	4.0	4.0	4.0	4.0	mA
1.0 ~ 19.9 MHz	4.0	4.6	5.6	7.6	mA
20.0 ~ 29.9 MHz	4.6	5.7	7.4	10.9	mA
30.0 ~ 49.9 MHz	5.1	6.7	9.2	14.3	mA
50.0 ~ 79.9 MHz	6.4	9.0	13.2		mA
80.0 ~ 110.0 MHz	7.7	11.2	17.0		mA
115.0 ~ 137.0 MHz	(10.0)	(14.5)			mA

note: current at default edge control setting "D", also refer to table 4.

TABLE 3: CONFIGURABLE STANDBY FUNCTION OPTIONS (E/D)		
pin #1 (e/d control)	option	functionality
low "0" (V <sub>IL</sub> ≤ 0.2 V <sub>DC</sub> )	S = Stop	output weakly pulled down, oscillator in sleep mode
	T = TriState	output high impedance, oscillator operates
	N = None	oscillator output active
high "1" (V <sub>IH</sub> ≥ 0.8 V <sub>DC</sub> )	all	oscillator output active
open*	all	oscillator output active

\* a pull up resistor is recommended in EMI stressed circuit environments.

RoHS compliant

Pb free

REACH compliant

Conflict mineral free

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# MEMS Oscillator · JSO LC series · 3.3 V



TABLE 4: MAX. RISE & FALL TIME VS. LOAD CAPACITANCE

C <sub>L</sub>	5 pF	15 pF	30 pF	5 pF	15 pF	30 pF
edge control	at 10% ~ 90% of V <sub>DC</sub> (ns)			at 20% ~ 80% of V <sub>DC</sub> (ns)		
0	1.0	1.7	3.6	0.7	1.2	2.6
1	1.1	1.8	4.4	0.7	1.3	3.0
2	1.2	2.6	5.0	0.8	1.8	3.3
D=3*	1.3	3.0	6.0	0.9	2.0	3.8
4	2.6	5.4	9.4	1.5	3.8	6.4
5	3.4	6.6	12.0	2.4	5.0	8.6
6	5.2	10.0	17.0	3.6	7.0	12.4
7	10.4	21.0	35.0	7.4	14.0	25.0

\* default edge control setting "D" at V<sub>DC</sub> = 2.8 V, please also refer to the supplementary information [on our homepage](#) for typical values and more details.

TABLE 5: NON-CONFIGURABLE FREQUENCIES

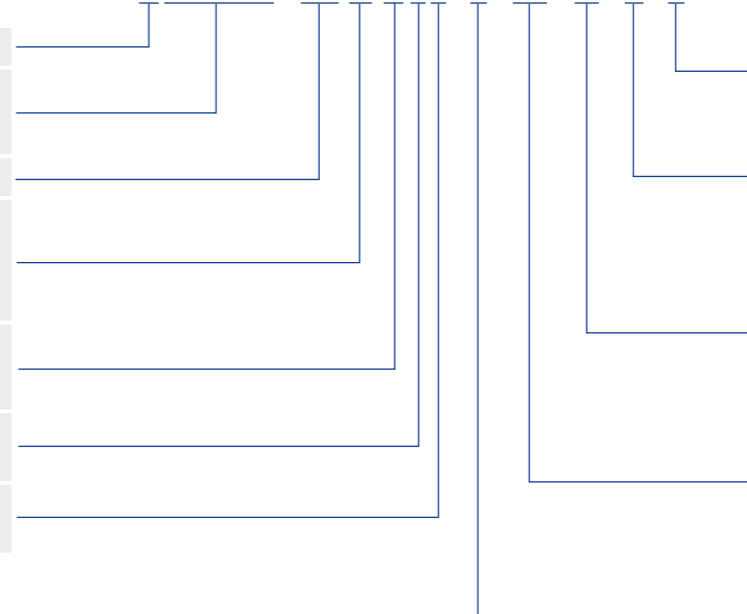
operating temperature option		operating temperature option	
T2 (-40°C ~ +105°C)		T8 (-55°C ~ +125°C)	
T3 (-40°C ~ +125°C)			
from (MHz)	to (MHz)	from (MHz)	to (MHz)
61.223	61.674	61.223	61.974
69.796	70.485	69.240	70.827
79.063	79.162	78.715	79.561
81.428	82.232	80.160	80.174
91.834	92.155	80.780	82.632
94.249	94.430	91.834	95.474
94.875	94.994	96.192	96.209
97.714	98.679	96.936	99.158
110.0	115.194	110.0	119.342
117.811	118.038	-	-
118.594	118.743	120.239	120.262
122.142	122.705	121.170	121.243
123.022	123.348	121.601	123.948

## ORDER INFORMATION

### EXAMPLE

O = Oscillator  
**frequency (8 digits, see also table 5)**  
 1.0 ~ 110.0 MHz  
 115.0 ~ 137.0 MHz  
 JSO = Jauch Silicon Oscillator  
**package**  
 75 = 7050    22 = 2520  
 53 = 5032    21 = 2016  
 32 = 3225  
**frequency range**  
 C1 = 1.0 ~ 110.0 MHz  
 C2 = 115.0 ~ 137.0 MHz  
**function/feature**  
 L = lowpower  
**output I/F**  
 C = (H)CMOS

O 26.123456 - JSO 75 C1 L C - B - 3.3 - T0 - S - D



- edge control**  
D = default  
0 - 7, see table 4
- standby function options**  
S = Stop  
T = TriState  
N = None
- temperature range**  
T0 = -20°C ~ +70°C  
T1 = -40°C ~ +85°C  
T2 = -40°C ~ +105°C  
T3 = -40°C ~ +125°C  
T8 = -55°C ~ +125°C
- supply voltage**  
3.3 = 3.3 V    2.5 = 2.5 V  
3.0 = 3.0 V    1.8 = 1.8 V  
2.8 = 2.8 V    2V3 = 2.5 V ~ 3.3 V
- frequency stability overall**  
B = ± 50 ppm  
G = ± 30 ppm  
C = ± 25 ppm  
D = ± 20 ppm



# MEMS Oscillator · JSO LC series 2.5 V ~ 3.3 V

- ▶ low power oscillator with HCMOS/LVCMOS output
- ▶ compatible to industry standard packages 2016 – 7050
- ▶ configured to customer's specification
- ▶ extended shock & vibration resistance
- ▶ very fast delivery service



actual size    2016    2520    3225    5032    7050

GENERAL DATA		
TYPE	JSOxxCxLC 2.5 V ~ 3.3 V	
frequency range	1.0 ~ 110.0 MHz (temp. range T0 ~ T8) 115.0 ~ 137.0 MHz (temp. range T0 ~ T1)	
frequency stability over all	±20 ppm ~ ±50 ppm (see table 1)	
current consumption	see table 2	
supply voltage V <sub>DC</sub>	2.5 V ~ 10% ~ 3.3 V + 10%	
temperature	operating	
	T0 = -20°C ~ +70°C	
	T1 = -40°C ~ +85°C	
	T2 = -40°C ~ +105°C	
	T3 = -40°C ~ +125°C	
T8 = -55°C ~ +125°C		
storage	-55°C ~ +150°C	
output	logic	HCMOS/LVCMOS
	rise & fall time	4.0 ns max. at 15 pF / 6.6 ns max. at 30 pF (see table 4)
	load max.	30 pF max. recommended (≤76.0 MHz)
		15 pF max. recommended (≤76.0 MHz)
	other load capacitances possible, see supplementary <a href="#">document</a>	
	current max.	3 mA
low level max.	0.1 x V <sub>DC</sub>	
high level min.	0.9 x V <sub>DC</sub>	
standby function (e/d)	stop (S), tristate-only (T) or none (N), see table 3	
output enable time max.	5 ms (S) / 150 ns (T)	
output disable time max.	150 ns	
start-up time max.	5 ms	
standby current max.	5 µA (for stop (S), see table 3)	
phase jitter 12 kHz ~ 20 MHz	< 3.0 ps RMS	
symmetry at 0.5 x V <sub>DC</sub>	45% ~ 55% (standard)	

note: some frequencies can't be configured, see table 5.

PACKING NOTE / MARKING	PIN CONNECTION
QTY < 250 pcs. → cut tape	
QTY 250/500/1K/3K pcs. → tape and reel	
Marking: lot code only	

TABLE 1: FREQUENCY STABILITY CODE					
stability code / temp. code*		B ±50 ppm	G ±30 ppm	C ±25 ppm	D ±20 ppm
-20°C ~ +70°C	T0	0	0	0	0
-40°C ~ +85°C	T1	0	0	0	0
-40°C ~ +105°C	T2	0	0	0	0
-40°C ~ +125°C	T3	0	0	0	0
-55°C ~ +125°C	T8	0	0	0	0
0 available					

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

TABLE 2: CURRENT CONSUMPTION TYP. (FOR MAX. ADD 30%)					
current at load	5 pF	15 pF	30 pF	60 pF	unit
output disabled	4.0	4.0	4.0	4.0	mA
1.0 ~ 19.9 MHz	4.0	4.6	5.6	7.6	mA
20.0 ~ 29.9 MHz	4.6	5.7	7.4	10.9	mA
30.0 ~ 49.9 MHz	5.1	6.7	9.2	14.3	mA
50.0 ~ 79.9 MHz	6.4	9.0	13.2		mA
80.0 ~ 110.0 MHz	7.7	11.2	17.0		mA
115.0 ~ 137.0 MHz	(10.0)	(14.5)			mA

note: current at default edge control setting "D", also refer to table 4.

TABLE 3: CONFIGURABLE STANDBY FUNCTION OPTIONS (E/D)		
pin #1 (e/d control)	option	functionality
low "0" (V <sub>IL</sub> ≤ 0.2 V <sub>DC</sub> )	S = Stop	output weakly pulled down, oscillator in sleep mode
	T = TriState	output high impedance, oscillator operates
high "1" (V <sub>IH</sub> ≥ 0.8 V <sub>DC</sub> )	N = None	oscillator output active
	all	oscillator output active
open*	all	oscillator output active

\* a pull up resistor is recommended in EMI stressed circuit environments.

RoHS compliant

Pb free

REACH compliant

Conflict mineral free

Jauch MEMS – Uses SiTime's MEMS First™ technology

# MEMS Oscillator · JSO LC series · 2.5 v ~ 3.3 V



TABLE 4: MAX. RISE & FALL TIME VS. LOAD CAPACITANCE						
C <sub>L</sub>	5 pF	15 pF	30 pF	5 pF	15 pF	30 pF
edge control	at 10% ~ 90% of V <sub>DC</sub> (ns)			at 20% ~ 80% of V <sub>DC</sub> (ns)		
0	1.2	2.4	5.2	0.8	1.7	3.4
1	1.4	2.6	5.8	0.9	1.9	3.8
2	1.6	3.0	6.0	1.1	2.1	4.0
D=3*	1.8	4.0	6.6	1.2	2.6	4.6
4	3.2	6.4	11.0	2.2	4.4	7.8
5	4.4	8.4	14.6	2.9	5.8	10.4
6	6.6	12.4	23.0	4.4	8.6	15.2
7	12.8	25.0	46.0	8.6	16.6	30.0

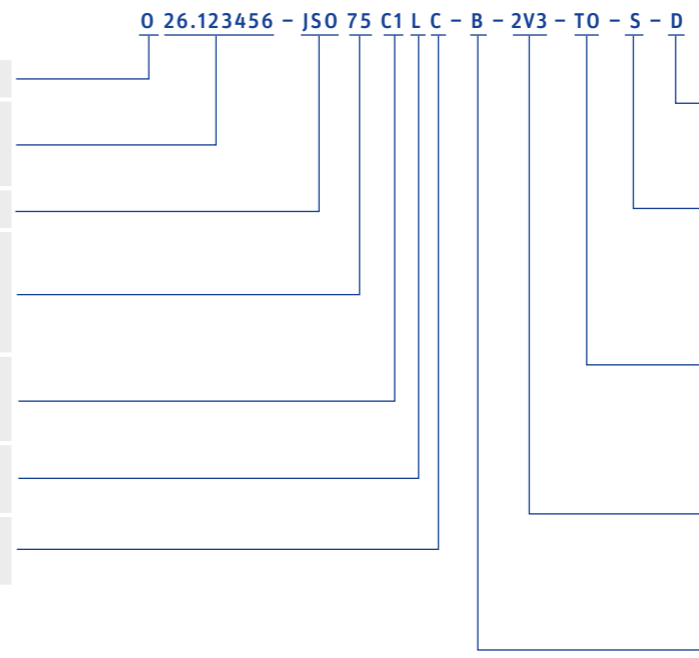
\* default edge control setting "D" at V<sub>DC</sub> = 2.8 V, please also refer to the supplementary information [on our homepage](#) for typical values and more details.

TABLE 5: NON-CONFIGURABLE FREQUENCIES			
operating temperature option		operating temperature option	
T2 - (-40°C ~ +105°C)		T8 - (-55°C ~ +125°C)	
T3 - (-40°C ~ +125°C)			
from (MHz)	to (MHz)	from (MHz)	to (MHz)
61.223	61.674	61.223	61.974
69.796	70.485	69.240	70.827
79.063	79.162	78.715	79.561
81.428	82.232	80.160	80.174
91.834	92.155	80.780	82.632
94.249	94.430	91.834	95.474
94.875	94.994	96.192	96.209
97.714	98.679	96.936	99.158
110.0	115.194	110.0	119.342
117.811	118.038	-	-
118.594	118.743	120.239	120.262
122.142	122.705	121.170	121.243
123.022	123.348	121.601	123.948

## ORDER INFORMATION

### EXAMPLE

- 0 = Oscillator
- frequency (8 digits, see also table 5)  
1.0 ~ 110.0 MHz  
115.0 ~ 137.0 MHz
- JSO = Jauch Silicon Oscillator
- package  
75 = 7050    22 = 2520  
53 = 5032    21 = 2016  
32 = 3225
- frequency range  
C1 = 1.0 ~ 110.0 MHz  
C2 = 115.0 ~ 137.0 MHz
- function/feature  
L = lowpower
- output I/F  
C = (H)CMOS

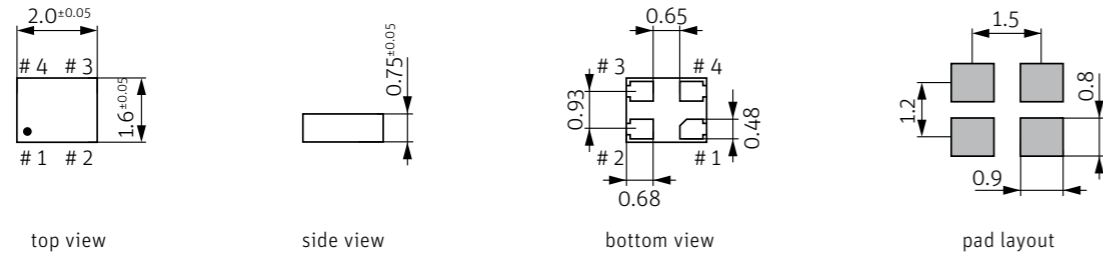


- edge control  
D = default  
0 ~ 7, see table 4
- standby function options  
S = Stop  
T = TriState  
N = None
- temperature range  
T0 = -20°C ~ +70°C  
T1 = -40°C ~ +85°C  
T2 = -40°C ~ +105°C  
T3 = -40°C ~ +125°C  
T8 = -55°C ~ +125°C
- supply voltage  
3.3 = 3.3 V    2.5 = 2.5 V  
3.0 = 3.0 V    1.8 = 1.8 V  
2.8 = 2.8 V    2V3 = 2.5 V ~ 3.3 V
- frequency stability overall  
B = ± 50 ppm  
G = ± 30 ppm  
C = ± 25 ppm  
D = ± 20 ppm



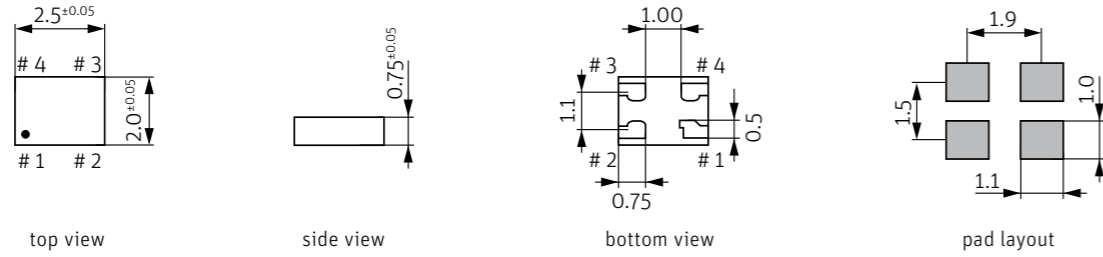
DIMENSIONS

2.0 x 1.6 x 0.75  
JSO21



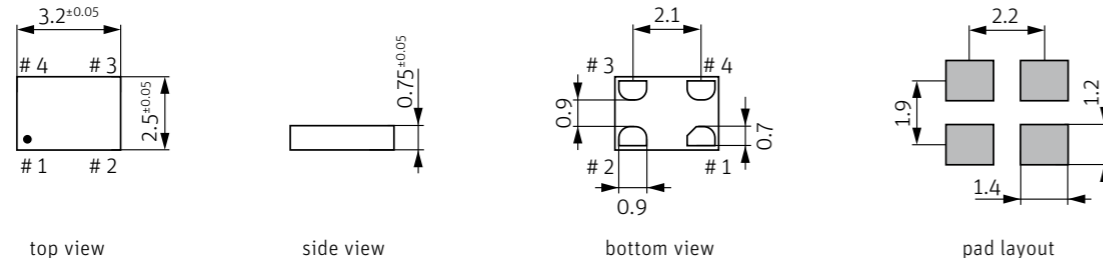
top view side view bottom view pad layout

2.5 x 2.0 x 0.75  
JSO22



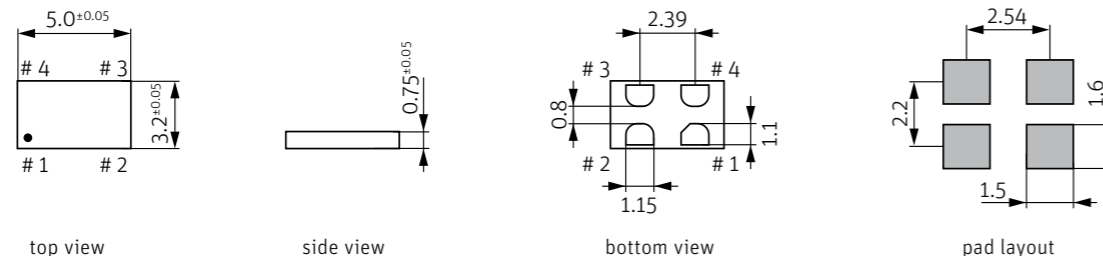
top view side view bottom view pad layout

3.2 x 2.5 x 0.75  
JSO32



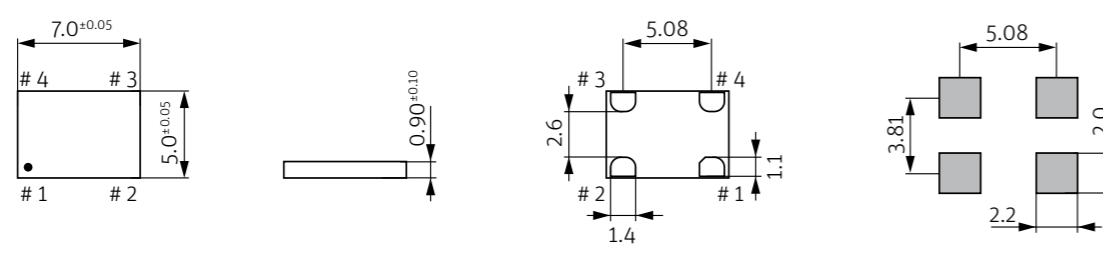
top view side view bottom view pad layout

5.0 x 3.2 x 0.75  
JSO53



top view side view bottom view pad layout

7.0 x 5.0 x 0.90  
JSO75

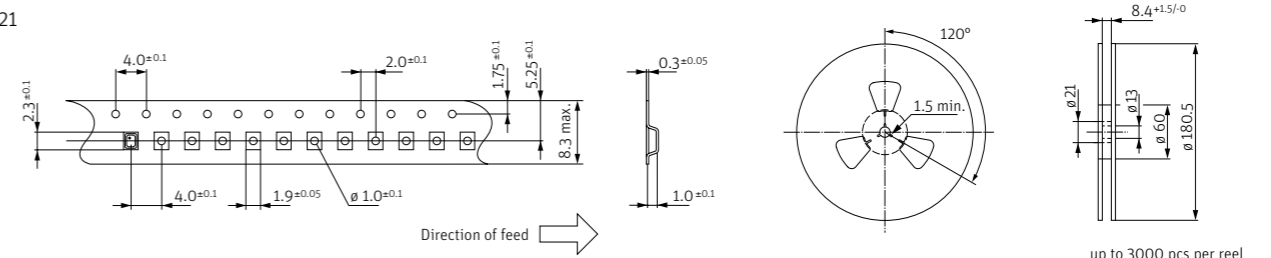


top view side view bottom view pad layout

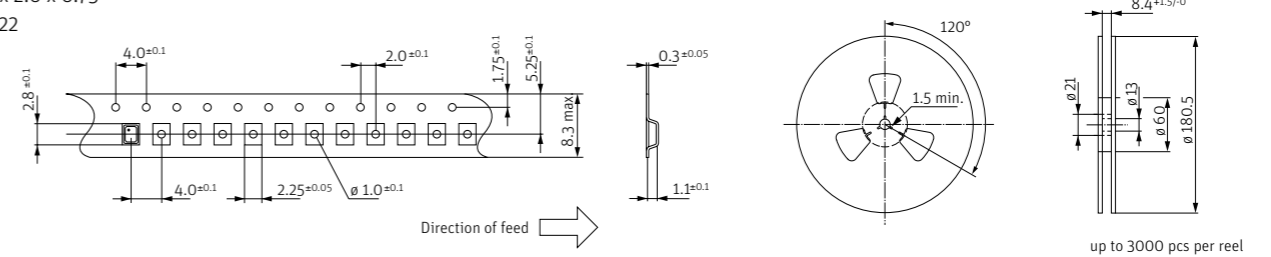
in mm Pin connection # 1: e/d # 2: GND # 3: output # 4: V<sub>DC</sub> note: a capacitor of 0.1 μF between V<sub>DC</sub> and GND is recommended

TAPING SPECIFICATION

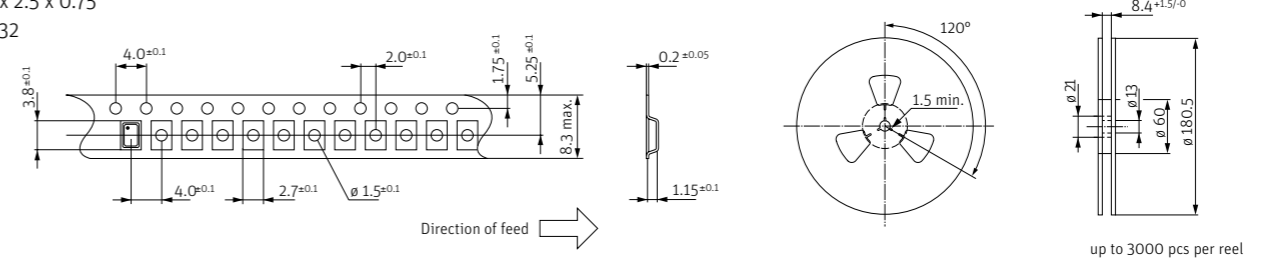
2.0 x 1.6 x 0.75  
JSO21



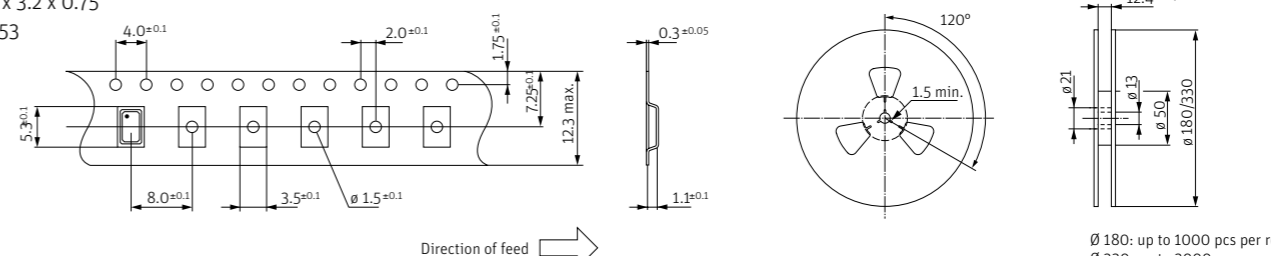
2.5 x 2.0 x 0.75  
JSO22



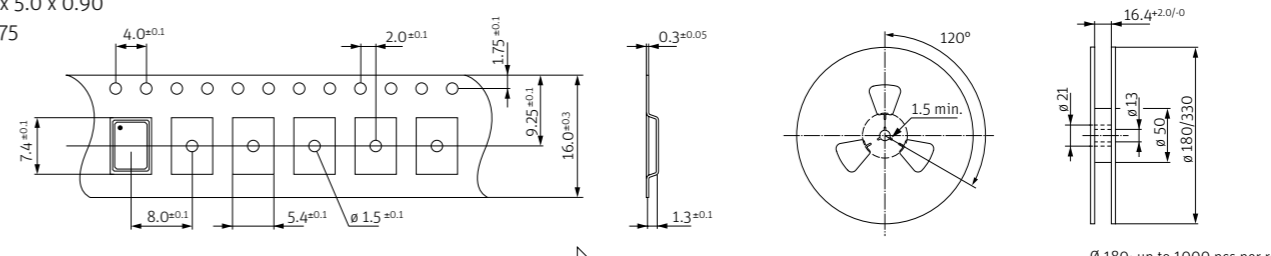
3.2 x 2.5 x 0.75  
JSO32



5.0 x 3.2 x 0.75  
JSO53



7.0 x 5.0 x 0.90  
JSO75



in mm



# RELIABLE AND SAFE: FREQUENCY PRODUCTS AND BATTERY SOLUTIONS FROM JAUCH



### ABOUT JAUCH

The Jauch Group is one of the leading specialists for quartz crystals, crystal oscillators, MEMS oscillators and battery technology. Established in 1954, we are a leading company in the frequency control products industry, and have recently added MEMS timing oscillators to our range. We are also a recognized expert for lithium ion and lithium polymer battery solutions.

With our in-depth technical consulting, certification expertise and advanced test environments, we are able to underline our claim to leadership.

Along with our subsidiaries in France, Great Britain and America, we are able to develop and provide pioneering technology solutions.





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