actual size

2016 2520 3225 5032 7050

MEMS Oscillator
JSO LC series · 1.8 V

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

RoHS compliant · Pb free · REACH compliant · Conflict mineral free

GENERAL DATA

TYPE		JSOxxCxLC 1.8 V
frequency range		1.0 ~ 110.0 MHz
		115.0 ~ 137.0 MHz
frequency stability over all		±20 ppm ~ ±50 ppm (see table 1)
current consumption		see table 2
supply voltage V_{DC}		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 document
	current max.	2 mA
	low level max.	0.1 x V_{DC}
	high level min.	0.9 x V_{DC}
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.		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 ±50 ppm	G ±30 ppm	C ±25 ppm	D ±20 ppm
-20°C ~ +70°C	T0	O	O	O	O
-40°C ~ +85°C	T1	O	O	O	O
-40°C ~ +105°C	T2	O	O	O	O
-40°C ~ +125°C	T3	O	O	O	O
-55°C ~ +125°C	T8	O	O	O	

O 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	3.5	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)

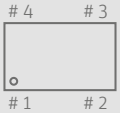
pin #1 (e/d control)	option	functionality
low "0" (V_{IL} ≤ 0.2 V_{DC})	S = Stop	output weakly pulled down, oscillator in sleep mode
	T = TriState	output high impedance, oscillator operates
	N = None	oscillator output active
high "1" (V_{IH} ≥ 0.8 V_{DC})	all	oscillator output active
open*	all	oscillator output active

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

PACKAGING NOTE / MARKING

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

PIN CONNECTION



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

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MEMS Oscillator · JSO LC series · 1.8 V

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

C_L	5 pF	15 pF	30 pF	5 pF	15 pF	30 pF
edge control	at 10% ~ 90% of V_{DC} (ns)			at 20% ~ 80% of V_{DC} (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) T3 – (-40°C ~ +125°C)		T8 – (-55°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 26.123456 – JSO 75 C1 L C – B – 1.8 – T0 – S – D

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
53 = 5032
32 = 3225
22 = 2520
21 = 2016

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
3.0 = 3.0 V
2.8 = 2.8 V
2.5 = 2.5 V
1.8 = 1.8 V
2V3 = 2.5 V ~ 3.3 V

frequency stability overall
B = ± 50 ppm
G = ± 30 ppm
C = ± 25 ppm
D = ± 20 ppm

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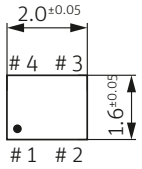
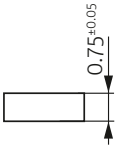
DIMENSIONS

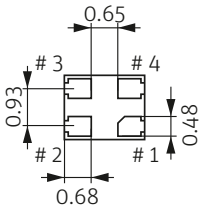
2.0 x 1.6 x 0.75
JS021 LC



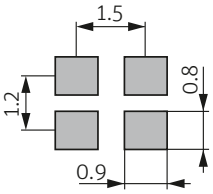
top view



side view

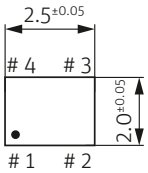


bottom view

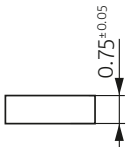


pad layout

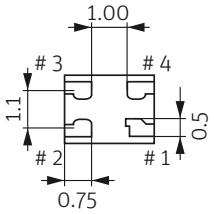
2.5 x 2.0 x 0.75
JS022 LC



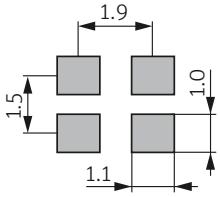
top view



side view

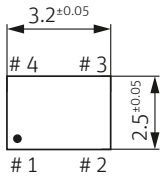


bottom view

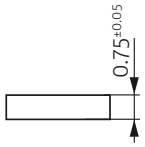


pad layout

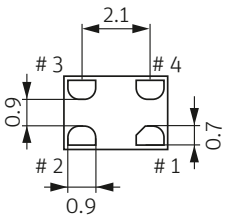
3.2 x 2.5 x 0.75
JS032 LC



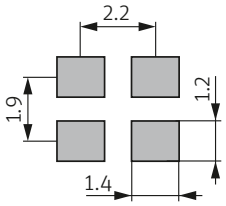
top view



side view

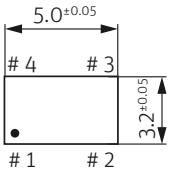


bottom view

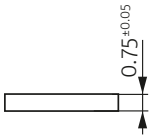


pad layout

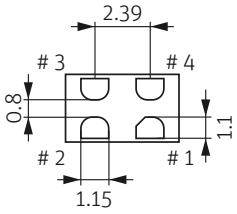
5.0 x 3.2 x 0.75
JS053 LC



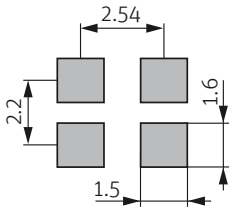
top view



side view

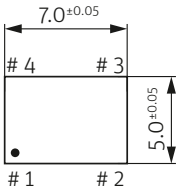


bottom view

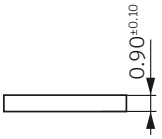


pad layout

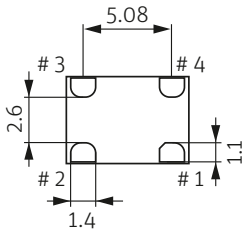
7.0 x 5.0 x 0.90
JS075 LC



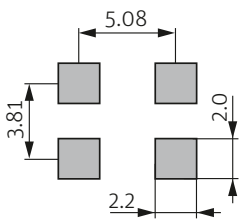
top view



side view



bottom view



pad layout

in mm

Pin connection # 1: e/d # 2: GND # 3: output # 4: V_{DC} note: a capacitor of 0.1 µF between V_{DC} and GND is recommended

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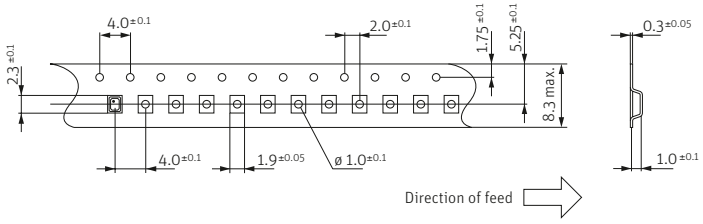
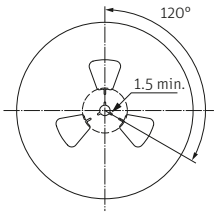
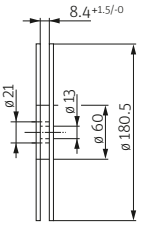
TAPING SPECIFICATION

2.0 x 1.6 x 0.75
JSO21 LC

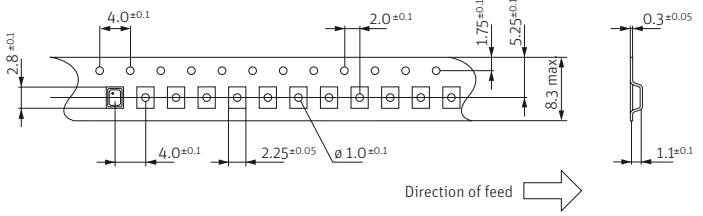


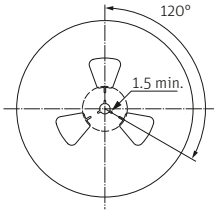


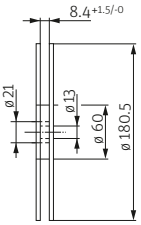


up to 3000 pcs per reel

2.5 x 2.0 x 0.75
JSO22 LC

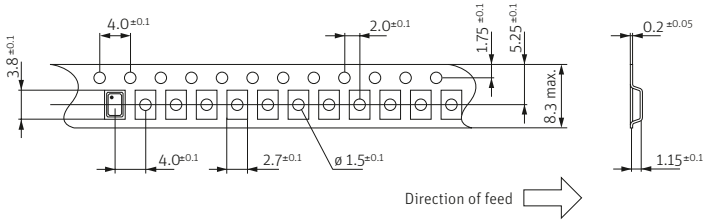


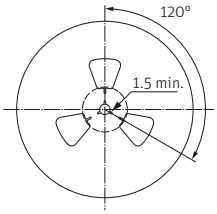


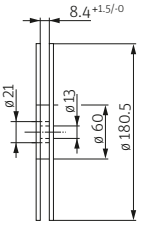


up to 3000 pcs per reel

3.2 x 2.5 x 0.75
JSO32 LC

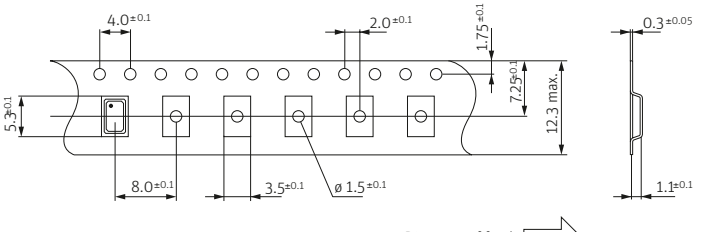


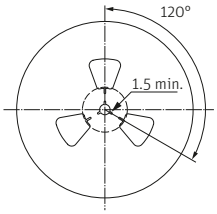


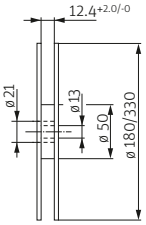


up to 3000 pcs per reel

5.0 x 3.2 x 0.75
JSO53 LC

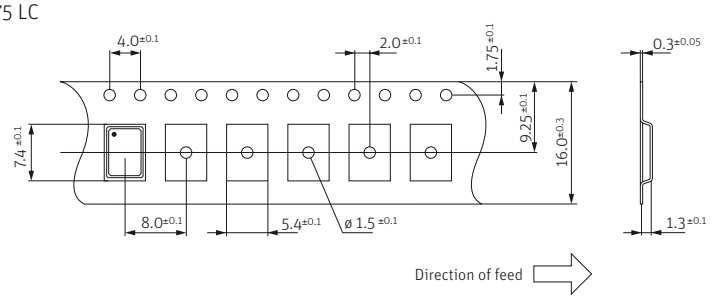


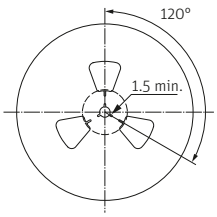


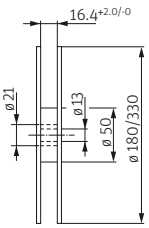


Ø 180: up to 1000 pcs per reel
Ø 330: up to 3000 pcs per reel

7.0 x 5.0 x 0.90
JSO75 LC







Ø 180: up to 1000 pcs per reel
Ø 330: up to 3000 pcs per reel

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