

MEMS OSCILLATORS

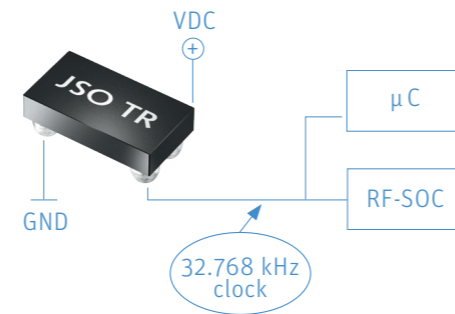


› MEMS Oscillators

JS015 TR

HIGHEST ACCURACY FOR RTC APPLICATIONS

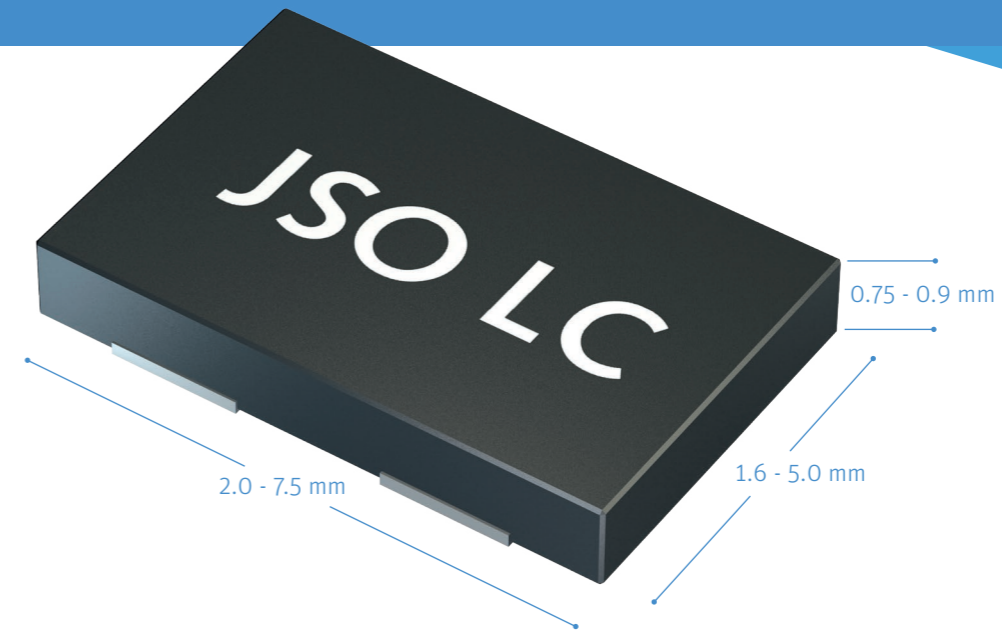
32.768 kHz



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 ± 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 ± 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
- › 10,000 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

TEMPERATURE COMPENSATED MEMS OSCILLATORS

EASY TO USE: JUST CONNECT VDC, FEED MULTIPLE CLOCK RECEIVERS

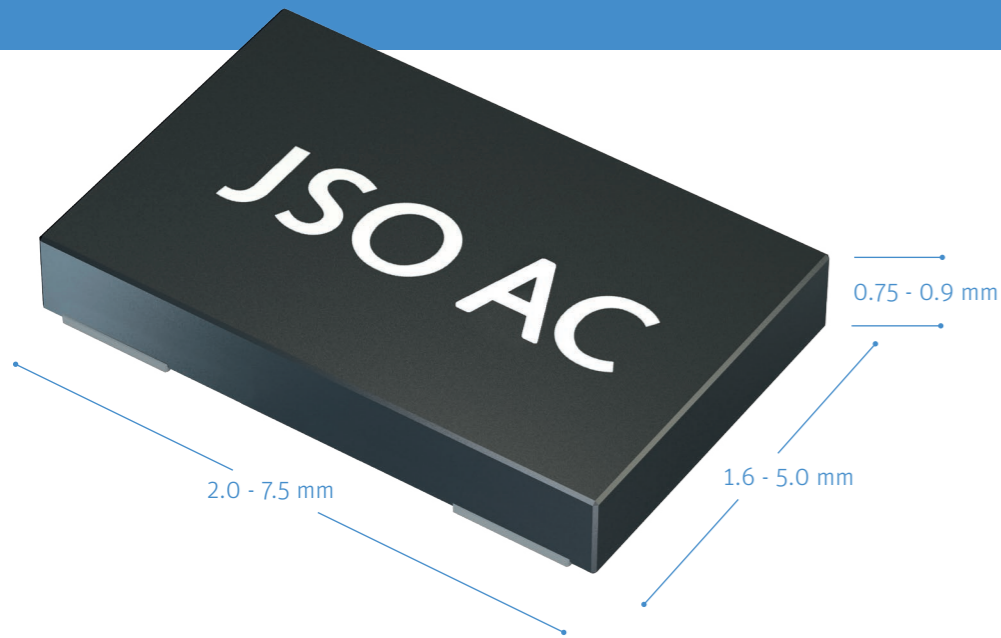
MEMS OSCILLATORS

EASY TO CONFIGURE: CHECK OUT OUR WEBSITE

JSO AC SERIES

AEC-Q100 QUALIFIED

1 MHz – 137 MHz



PRODUCT FEATURES

- › Silicon MEMS resonator based oscillators
- › AEC-Q100 qualified
- › Frequency range 1 MHz ~ 137 MHz
- › Best temperature stability ± 20 ppm
- › Widest temperature range -55°C ~ +125°C
- › Supply voltage range 1.8 Volt ~ 3.3 Volt
- › Compatible to all standard oscillator packages and pad layouts
- › 10,000 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

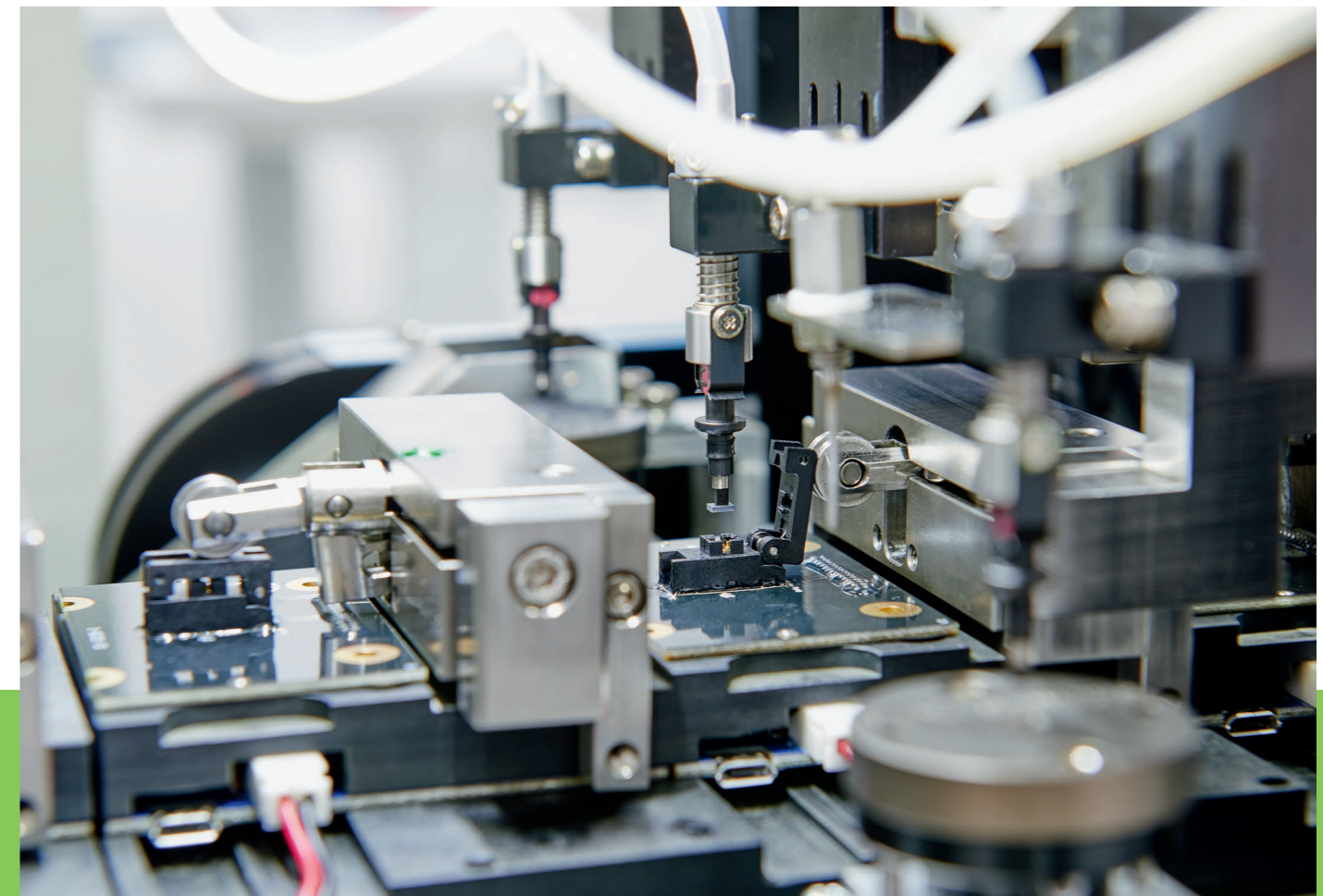
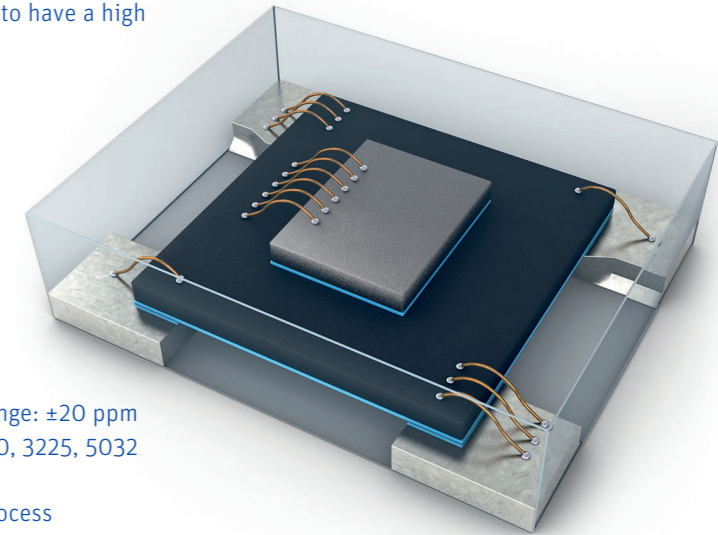
- › Local configuration center in Germany
- › Technical customer support by field application engineers
- › Free samples shipped within 48 hours

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 – TYPE JSO AC AVAILABLE

- › AEC-Q100
- › Extremely high impact, shock and vibration resistance: 10,000 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: ± 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



MEMS OSCILLATORS FOR AUTOMOTIVE APPLICATIONS

EASY TO CONFIGURE: CHECK OUT OUR WEBSITE



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

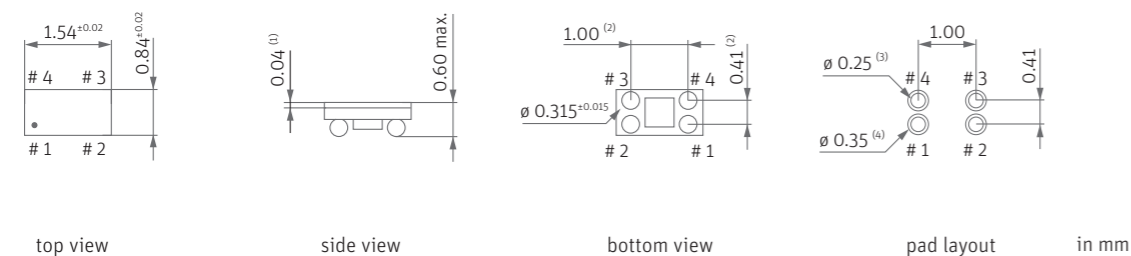


GENERAL DATA

TYPE		JSO15B1TR
supply voltage V_{DC}		1.5 V ~ 3.63 V
current consumption typ.		1.2 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.	$0.1 \times V_{DC}$
	high level min.	$0.9 \times V_{DC}$
	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

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

PIN CONNECTION



TABLE 1: FREQUENCY STABILITY CODE

stability code / temp. code including frequency tolerance* excluding frequency tolerance**	D	K	F
± 22 ppm	± 20 ppm	± 13 ppm	± 10 ppm
± 10 ppm	± 5 ppm		
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				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

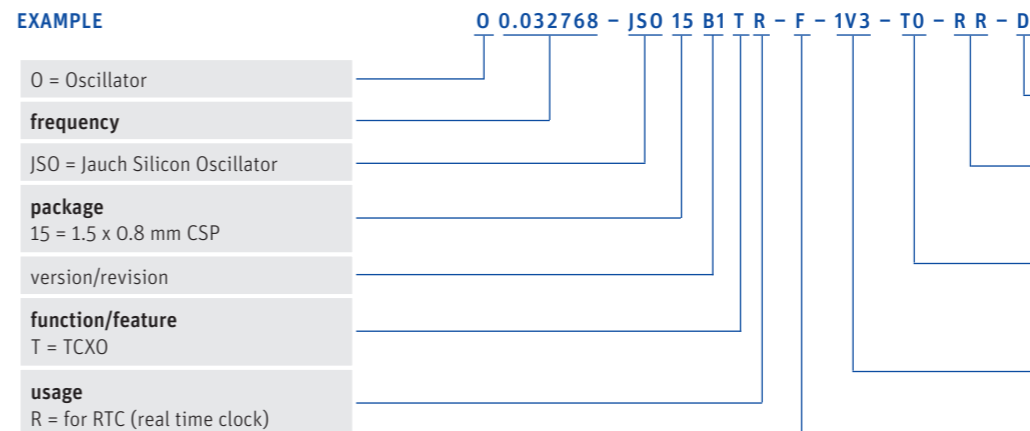
* repetitive temp. compensation consuming 6 μ A for 10 ms, repeating every 350 ms

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

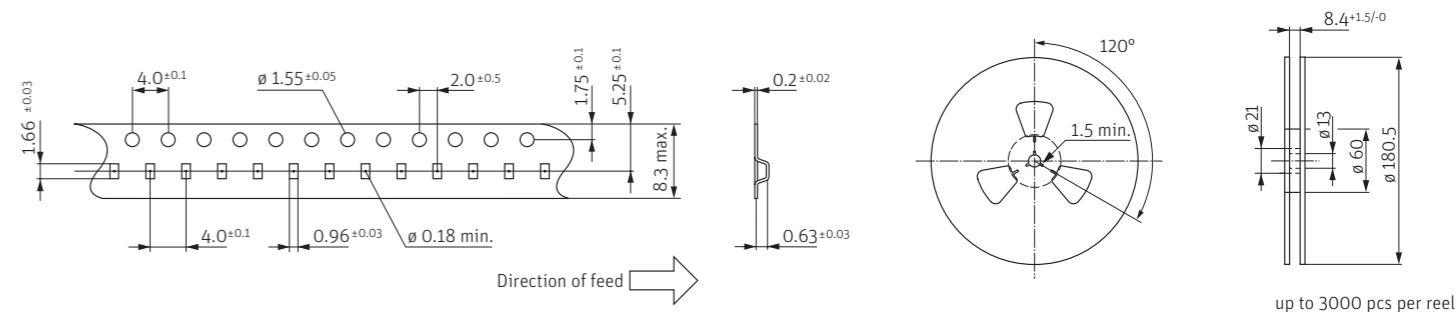
frequency stability
F = ± 5 ppm
K = ± 10 ppm
D = ± 20 ppm
see table 1

NOTE

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

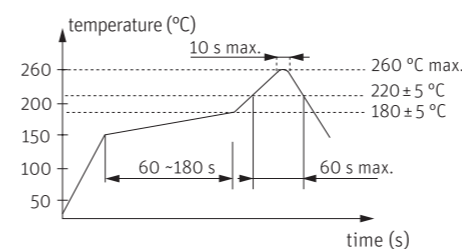
Frequency stability (table 1): F = ± 5 ppm
Operating temperature range: T1 = -40°C ~ +85°C
Supply voltage: 1V3 = 1.5 V ~ 3.63 V variable

TAPING SPECIFICATION



up to 3000 pcs per reel

REFLOW SOLDERING PROFILE



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

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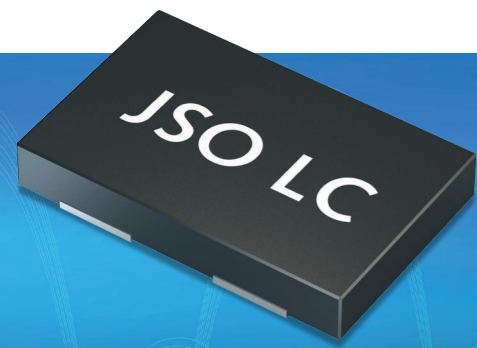
RoHS compliant

Pb free

REACH compliant

Conflict mineral free

Jauch MEMS – Uses SiTime's MEMS First™ technology



MEMS Oscillator · JSO LC series · 1.8 V

- › 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



actual size 2016 2520 3225 5032 7050

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.

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	3.5	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.

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 _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.

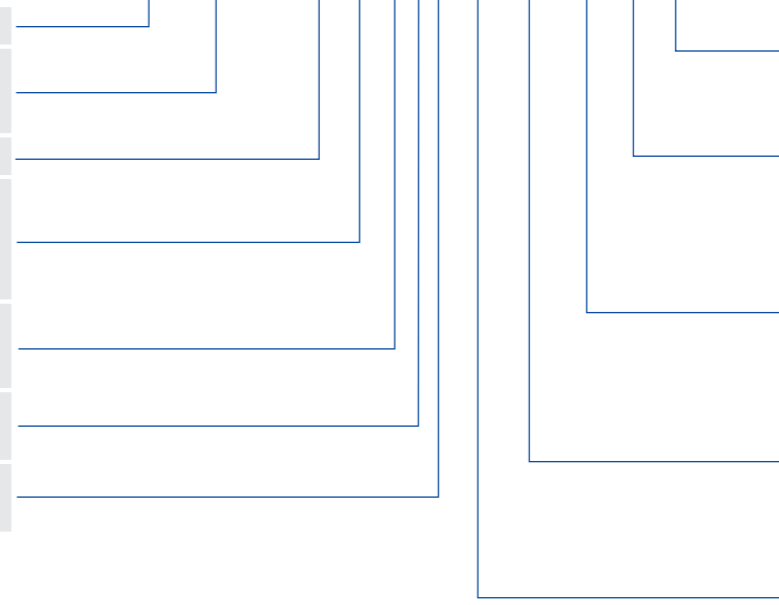
TABLE 5: NON-CONFIGURABLE FREQUENCIES			
operating temperature option		operating temperature option	
T2 – (-40°C ~ +105°C)		T8 – (-55°C ~ +125°C)	
T3 – (-40°C ~ +125°C)			
from (MHz)	to (MHz)	from (MHz)	to (MHz)
61.223	61.674	61.223	61.974
69.796	70.485	69.240	70.827
79.063	79.162	78.715	79.561
81.428	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



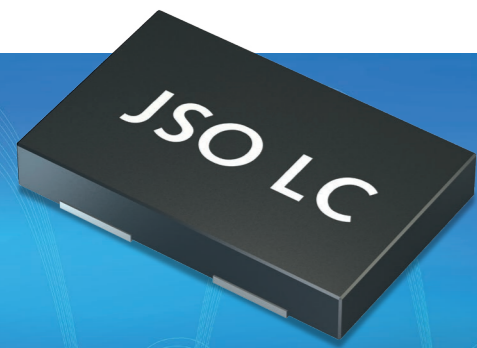
edge control
 D = default
 0 - 7, see table 4

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
- > extended shock & vibration resistance & temperature range
- > configured to customer's specification
- > 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 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}	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 document	
	current max.	3 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.	3 µA (for stop (S), see table 3)	
phase jitter 12 kHz ~ 20 MHz	< 3.0 ps RMS	
symmetry at 0.5 x V _{DC}	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 _{DC} # 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 _{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.

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 _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)		
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_{DC} = 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
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

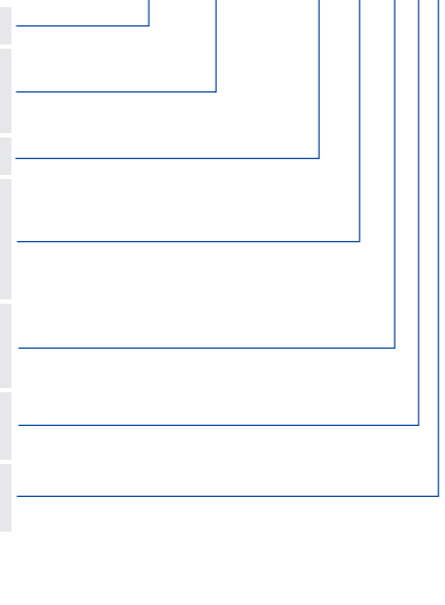
package
75 = 7050 22 = 2520
53 = 5032 21 = 2016
32 = 3225

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 – 2.5 – T0 – S – D



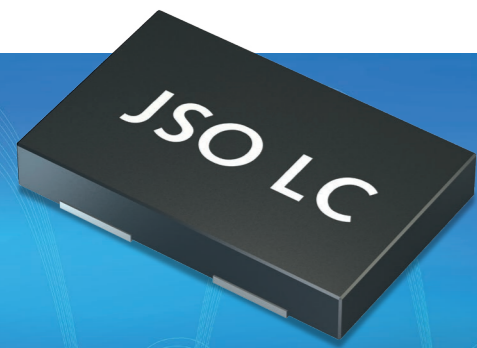
edge control
D = default
0 – 7, see table 4

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
- › extended shock & vibration resistance & temperature range
- › configured to customer's specification
- › 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 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}	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 document	
	current max.	3 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.	4 µA (for stop (S), see table 3)	
phase jitter 12 kHz ~ 20 MHz	< 3.0 ps RMS	
symmetry at 0.5 x V _{DC}	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	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 _{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.

RoHS compliant

Pb free

REACH compliant

Conflict mineral free

Jauch MEMS – Uses SiTime's MEMS First™ technology

MEMS Oscillator · JSO LC series · 2.8 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)		
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_{DC} = 2.8 V, please also refer to the supplementary information [on our homepage](#) for typical values and more details.

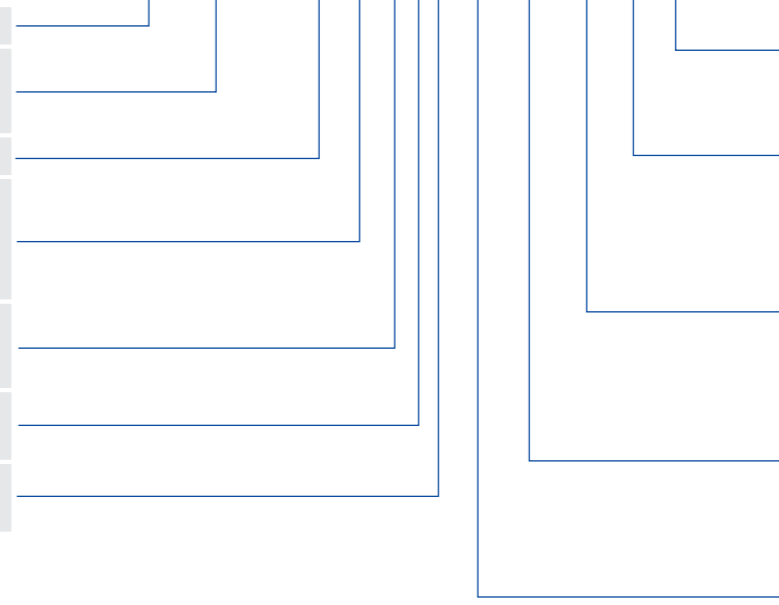
TABLE 5: NON-CONFIGURABLE FREQUENCIES			
operating temperature option		operating temperature option	
T2 – (-40°C ~ +105°C)		T8 – (-55°C ~ +125°C)	
T3 – (-40°C ~ +125°C)			
from (MHz)	to (MHz)	from (MHz)	to (MHz)
61.223	61.674	61.223	61.974
69.796	70.485	69.240	70.827
79.063	79.162	78.715	79.561
81.428	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

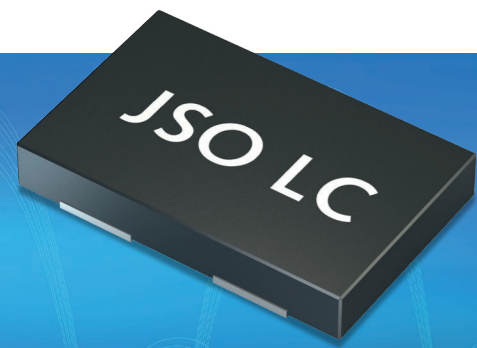
EXAMPLE

- 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

0 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
- › extended shock & vibration resistance & temperature range
- › configured to customer's specification
- › 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 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}	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 document	
	current max.	4 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.	5 µA (for stop (S), see table 3)	
phase jitter 12 kHz ~ 20 MHz	< 3.0 ps RMS	
symmetry at 0.5 x V _{DC}	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 _{DC} # 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	3.9	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	15.5		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 _{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.

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 _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)		
0	1.1	2.0	4.2	0.7	1.4	2.8
1	1.2	2.2	4.8	0.8	1.6	3.3
2	1.3	2.8	5.4	0.9	1.9	3.6
D=3*	1.5	3.3	6.2	1.0	2.2	4.0
4	2.8	5.8	10.0	1.8	4.0	6.8
5	3.8	7.4	13.0	2.6	5.2	9.0
6	5.5	11.0	19.0	3.8	7.6	13.4
7	11.4	22.0	40.0	7.8	14.6	27.0

* default edge control setting "D" at V_{DC} = 3.0 V, please also refer to the supplementary information [on our homepage](#) for typical values and more details.

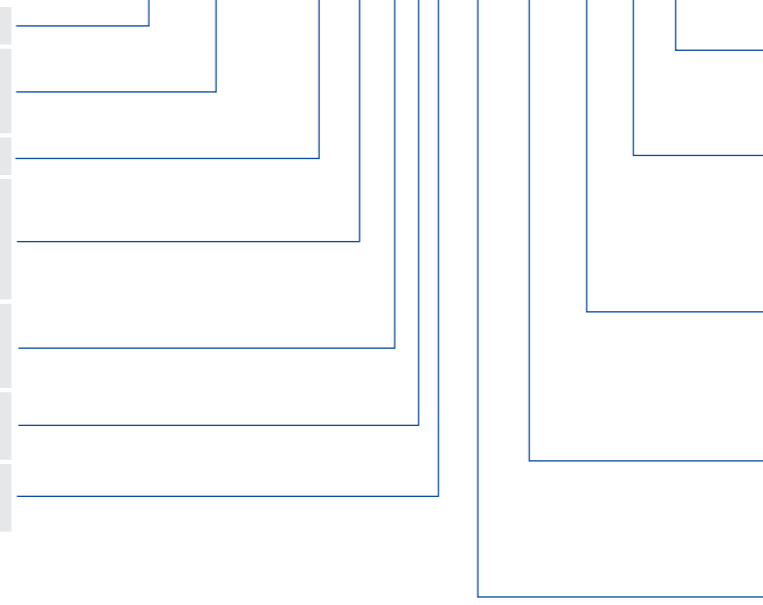
TABLE 5: NON-CONFIGURABLE FREQUENCIES			
operating temperature option		operating temperature option	
T2 – (-40°C ~ +105°C)		T8 – (-55°C ~ +125°C)	
T3 – (-40°C ~ +125°C)			
from (MHz)	to (MHz)	from (MHz)	to (MHz)
61.223	61.674	61.223	61.974
69.796	70.485	69.240	70.827
79.063	79.162	78.715	79.561
81.428	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

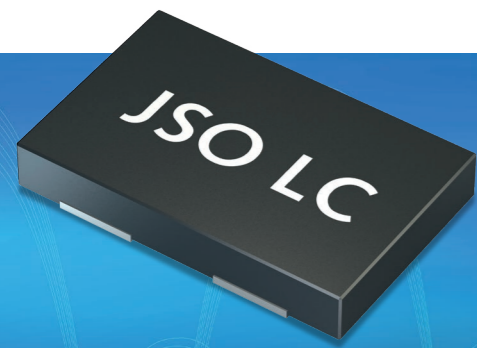
EXAMPLE

- 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 – 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
- › extended shock & vibration resistance & temperature range
- › configured to customer's specification
- › 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 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}	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 document	
	current max.	4 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.	5 µA (for stop (S), see table 3)	
phase jitter 12 kHz ~ 20 MHz	< 3.0 ps RMS	
symmetry at 0.5 x V _{DC}	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 _{DC} # 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 _{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.

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 _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)		
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_{DC} = 3.3 V, please also refer to the supplementary information [on our homepage](#) for typical values and more details.

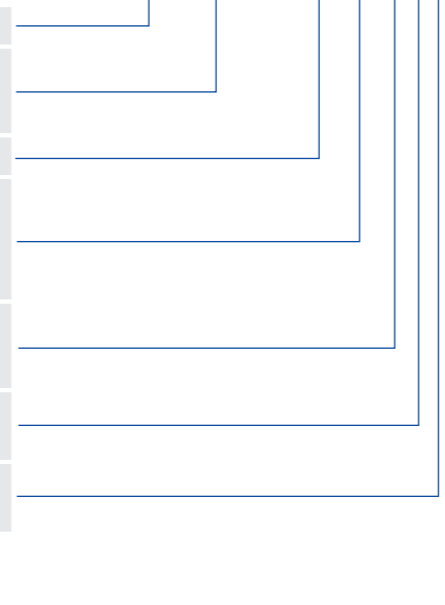
TABLE 5: NON-CONFIGURABLE FREQUENCIES			
operating temperature option		operating temperature option	
T2 – (-40°C ~ +105°C)		T8 – (-55°C ~ +125°C)	
T3 – (-40°C ~ +125°C)			
from (MHz)	to (MHz)	from (MHz)	to (MHz)
61.223	61.674	61.223	61.974
69.796	70.485	69.240	70.827
79.063	79.162	78.715	79.561
81.428	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 – 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
- > extended shock & vibration resistance & temperature range
- > configured to customer's specification
- > 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 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}	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 document	
	current max.	3 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.	5 µA (for stop (S), see table 3)	
phase jitter 12 kHz ~ 20 MHz	< 3.0 ps RMS	
symmetry at 0.5 x V _{DC}	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	<p># 4: V_{DC} # 3: output # 1: e/d # 2: GND</p>

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 _{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.

RoHS compliant

Pb free

REACH compliant

Conflict mineral free

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MEMS Oscillator · JSO LC series · 2.5 V ~ 3.3 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)		
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_{DC} = 2.5 ~ 3.3 V, please also refer to the supplementary information [on our homepage](#) for typical values and more details.

TABLE 5: NON-CONFIGURABLE FREQUENCIES

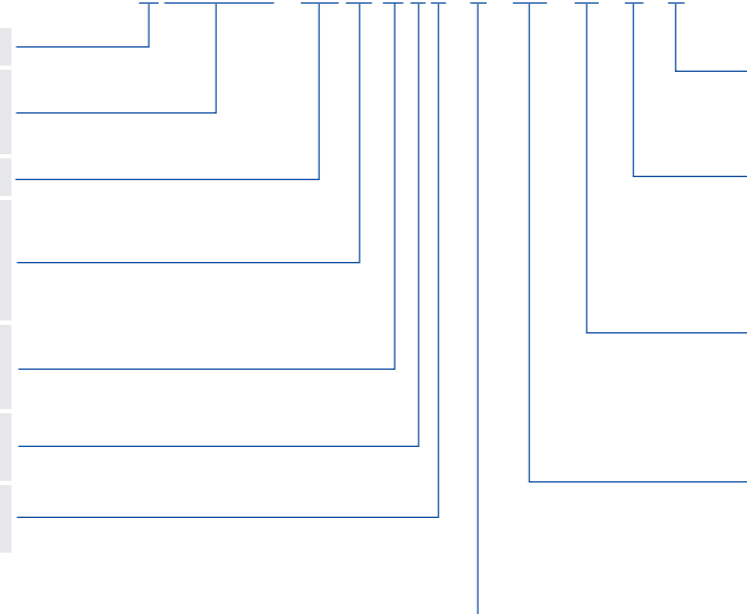
operating temperature option		operating temperature option	
T2 – (-40°C ~ +105°C)		T8 – (-55°C ~ +125°C)	
T3 – (-40°C ~ +125°C)			
from (MHz)	to (MHz)	from (MHz)	to (MHz)
61.223	61.674	61.223	61.974
69.796	70.485	69.240	70.827
79.063	79.162	78.715	79.561
81.428	82.232	80.160	80.174
91.834	92.155	80.780	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 – 2V3 – 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 AC series · 1.8 V

- › low power oscillator with HCMOS/LVCMOS output
- › qualified according to AEC-Q100
- › compatible to industry standard packages 2016 – 7050
- › extended shock & vibration resistance & temperature range
- › configured to customer's specification
- › very fast delivery service



actual size 2016 2520 3225 5032 7050

GENERAL DATA	
TYPE	JSOxxDxAC 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
	storage
output	logic
	rise & fall time
	load max.
	current max.
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.	150 ns (T) / 10 ms (S)
output disable time max.	150 ns
start-up time max.	10 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 V _{DC}	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	<p># 4: V_{DC} # 3: output # 1: e/d # 2: GND</p>

TABLE 1: FREQUENCY STABILITY CODE						
stability code / temp. code*	B	G	C	D	AEC-Q100 Grade	
	±50 ppm	±30 ppm	±25 ppm	±20 ppm		
-40°C ~ +85°C T1	0	0	0	0	3	
-40°C ~ +105°C T2	0	0	0	0	2	
-40°C ~ +125°C T3	0	0	0	0	1	
-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	3.5	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.

RoHS compliant

Pb free

REACH compliant

Conflict mineral free

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MEMS Oscillator · JSO AC 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 V_{DC} = 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 26.123456 - JSO 75 D1 A C - B - 1.8 - T1 - 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 22 = 2520
53 = 5032 21 = 2016
32 = 3225

frequency range
D1 = 1.0 ~ 110.0 MHz
D2 = 115.0 ~ 137.0 MHz

function/feature
A = automotive

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
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 AC series · 2.5 V

- > low power oscillator with HCMOS/LVCMOS output
- > qualified according to AEC-Q100
- > compatible to industry standard packages 2016 – 7050
- > extended shock & vibration resistance & temperature range
- > configured to customer's specification
- > very fast delivery service



actual size 2016 2520 3225 5032 7050

GENERAL DATA		
TYPE	JSOxxDxAc 2.5 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}	2.5 V ± 10%	
temperature	operating	
	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 document	
current max.	3 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.	150 ns (T) / 10 ms (S)	
output disable time max.	150 ns	
start-up time max.	10 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 _{DC}	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	<p># 4: V_{DC} # 3: output # 1: e/d # 2: GND</p>

TABLE 1: FREQUENCY STABILITY CODE						
stability code / temp. code*	B	G	C	D	AEC-Q100 Grade	
	±50 ppm	±30 ppm	±25 ppm	±20 ppm		
-40°C ~ +85°C T1	0	0	0	0	3	
-40°C ~ +105°C T2	0	0	0	0	2	
-40°C ~ +125°C T3	0	0	0	0	1	
-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 _{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.

RoHS compliant

Pb free

REACH compliant

Conflict mineral free

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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)		
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_{DC} = 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
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 D1 A C - B - 2.5 - T1 - 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 22 = 2520
53 = 5032 21 = 2016
32 = 3225

frequency range
D1 = 1.0 ~ 110.0 MHz
D2 = 115.0 ~ 137.0 MHz

function/feature
A = automotive

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
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 AC series · 2.8 V

- › low power oscillator with HCMOS/LVCMOS output
- › qualified according to AEC-Q100
- › compatible to industry standard packages 2016 – 7050
- › extended shock & vibration resistance & temperature range
- › configured to customer's specification
- › very fast delivery service



actual size 2016 2520 3225 5032 7050

GENERAL DATA			
TYPE	JSOxxDxAC 2.8 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}	2.8 V ± 10%		
temperature	operating	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 document	
current max.		3 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.	150 ns (T) / 10 ms (S)		
output disable time max.	150 ns		
start-up time max.	10 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 _{DC}	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	<p># 4: V_{DC} # 3: output # 1: e/d # 2: GND</p>

TABLE 1: FREQUENCY STABILITY CODE						
stability code / temp. code*	B	G	C	D	AEC-Q100 Grade	
	±50 ppm	±30 ppm	±25 ppm	±20 ppm		
-40°C ~ +85°C T1	0	0	0	0	3	
-40°C ~ +105°C T2	0	0	0	0	2	
-40°C ~ +125°C T3	0	0	0	0	1	
-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 _{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.

RoHS compliant

Pb free

REACH compliant

Conflict mineral free

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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)		
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_{DC} = 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 26.123456 - JSO 75 D1 A C - B - 2.8 - T1 - 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 22 = 2520
53 = 5032 21 = 2016
32 = 3225

frequency range
D1 = 1.0 ~ 110.0 MHz
D2 = 115.0 ~ 137.0 MHz

function/feature
A = automotive

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
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 AC series · 3.0 V

- › low power oscillator with HCMOS/LVCMOS output
- › qualified according to AEC-Q100
- › compatible to industry standard packages 2016 – 7050
- › extended shock & vibration resistance & temperature range
- › configured to customer's specification
- › very fast delivery service



actual size 2016 2520 3225 5032 7050

GENERAL DATA	
TYPE	JSOxxDxAc 3.0 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}	3.0 V ± 10%
temperature	operating
	storage
output	logic
	rise & fall time
	load max.
	current max.
	low level max.
standby function (e/d)	stop (S), tristate-only (T) or none (N), see table 3
output enable time max.	150 ns (T) / 10 ms (S)
output disable time max.	150 ns
start-up time max.	10 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 _{DC}	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	<p># 4: V_{DC} # 3: output # 1: e/d # 2: GND</p>

TABLE 1: FREQUENCY STABILITY CODE						
stability code / temp. code*	B	G	C	D	AEC-Q100 Grade	
	±50 ppm	±30 ppm	±25 ppm	±20 ppm		
-40°C ~ +85°C T1	0	0	0	0	3	
-40°C ~ +105°C T2	0	0	0	0	2	
-40°C ~ +125°C T3	0	0	0	0	1	
-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	15.5		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 _{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.

RoHS compliant

Pb free

REACH compliant

Conflict mineral free

Jauch MEMS – Uses SiTime's MEMS First™ technology

MEMS Oscillator · JSO AC series · 3.0 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)		
0	1.1	2.0	4.2	0.7	1.4	2.8
1	1.2	2.2	4.8	0.8	1.6	3.3
2	1.3	2.8	5.4	0.9	1.9	3.6
D=3*	1.5	3.3	6.2	1.0	2.2	4.0
4	2.8	5.8	10.0	1.8	4.0	6.8
5	3.8	7.4	13.0	2.6	5.2	9.0
6	5.5	11.0	19.0	3.8	7.6	13.4
7	11.4	22.0	40.0	7.8	14.6	27.0

* default edge control setting "D" at V_{DC} = 3.0 V, please also refer to the supplementary information on our homepage for typical values and more details.

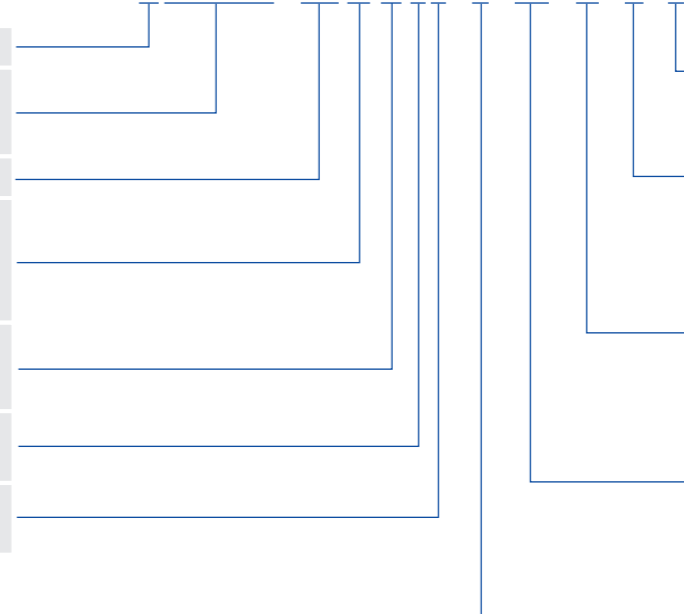
TABLE 5: NON-CONFIGURABLE FREQUENCIES			
operating temperature option		operating temperature option	
T2 (-40°C ~ +105°C)		T8 (-55°C ~ +125°C)	
T3 (-40°C ~ +125°C)			
from (MHz)	to (MHz)	from (MHz)	to (MHz)
61.223	61.674	61.223	61.974
69.796	70.485	69.240	70.827
79.063	79.162	78.715	79.561
81.428	82.232	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
 D1 = 1.0 ~ 110.0 MHz
 D2 = 115.0 ~ 137.0 MHz
function/feature
 A = automotive
output I/F
 C = (H)CMOS

O 26.123456 - JSO 75 D1 A C - B - 3.0 - T1 - S - D



- edge control**
D = default
0 - 7, see table 4
- standby function options**
S = Stop
T = TriState
N = None
- temperature range**
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 AC series · 3.3 V

- › low power oscillator with HCMOS/LVCMOS output
- › qualified according to AEC-Q100
- › compatible to industry standard packages 2016 – 7050
- › extended shock & vibration resistance & temperature range
- › configured to customer's specification
- › very fast delivery service



actual size 2016 2520 3225 5032 7050

GENERAL DATA	
TYPE	JSOxxDxAc 3.3 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}	3.3 V ± 10%
temperature	operating
	storage
output	logic
	rise & fall time
	load max.
	current max.
	low level max.
high level min.	
standby function (e/d)	stop (S), tristate-only (T) or none (N), see table 3
output enable time max.	150 ns (T) / 10 ms (S)
output disable time max.	150 ns
start-up time max.	10 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 _{DC}	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	<p># 4: V_{DC} # 3: output # 1: e/d # 2: GND</p>

TABLE 1: FREQUENCY STABILITY CODE						
stability code / temp. code*	B	G	C	D	AEC-Q100 Grade	
	±50 ppm	±30 ppm	±25 ppm	±20 ppm		
-40°C ~ +85°C T1	0	0	0	0	3	
-40°C ~ +105°C T2	0	0	0	0	2	
-40°C ~ +125°C T3	0	0	0	0	1	
-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 _{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.

RoHS compliant

Pb free

REACH compliant

Conflict mineral free

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MEMS Oscillator · JSO AC series · 3.3 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)		
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_{DC} = 3.3 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 26.123456 - JSO 75 D1 A C - B - 3.3 - T1 - 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 22 = 2520
53 = 5032 21 = 2016
32 = 3225

frequency range
D1 = 1.0 ~ 110.0 MHz
D2 = 115.0 ~ 137.0 MHz

function/feature
A = automotive

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
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 AC series 2.5 V ~ 3.3 V

- > low power oscillator with HCMOS/LVCMOS output
- > qualified according to AEC-Q100
- > compatible to industry standard packages 2016 – 7050
- > extended shock & vibration resistance & temperature range
- > configured to customer's specification
- > very fast delivery service



actual size 2016 2520 3225 5032 7050

GENERAL DATA

TYPE	JSOxxDxAc 2.5 V ~ 3.3 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}	2.5 V ~ 10% ~ 3.3 V + 10%	
temperature	operating	
	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 document	
	current max.	3 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.	150 ns (T) / 10 ms (S)	
output disable time max.	150 ns	
start-up time max.	10 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 _{DC}	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

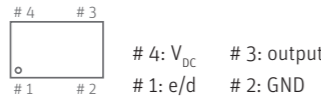


TABLE 1: FREQUENCY STABILITY CODE

stability code / temp. code*	B	G	C	D	AEC-Q100 Grade
	±50 ppm	±30 ppm	±25 ppm	±20 ppm	
-40°C ~ +85°C T1	0	0	0	0	3
-40°C ~ +105°C T2	0	0	0	0	2
-40°C ~ +125°C T3	0	0	0	0	1
-55°C ~ +125°C T8	0	0	0	0	

* 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 _{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.

RoHS compliant

Pb free

REACH compliant

Conflict mineral free

Jauch MEMS – Uses SiTime's MEMS First™ technology

MEMS Oscillator · JSO AC series · 2.5 V ~ 3.3 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)		
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_{DC} = 2.5 ~ 3.3 V, please also refer to the supplementary information [on our homepage](#) for typical values and more details.

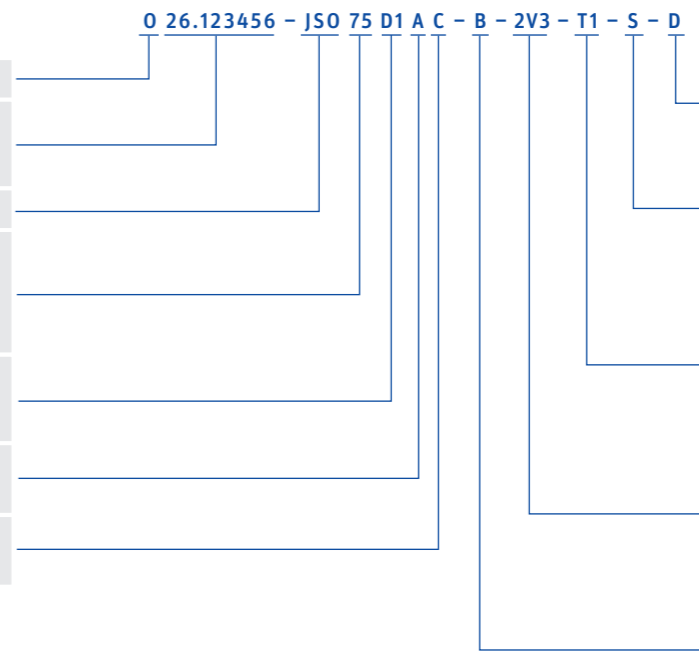
TABLE 5: NON-CONFIGURABLE FREQUENCIES

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
 D1 = 1.0 ~ 110.0 MHz
 D2 = 115.0 ~ 137.0 MHz
function/feature
 A = automotive
output I/F
 C = (H)CMOS

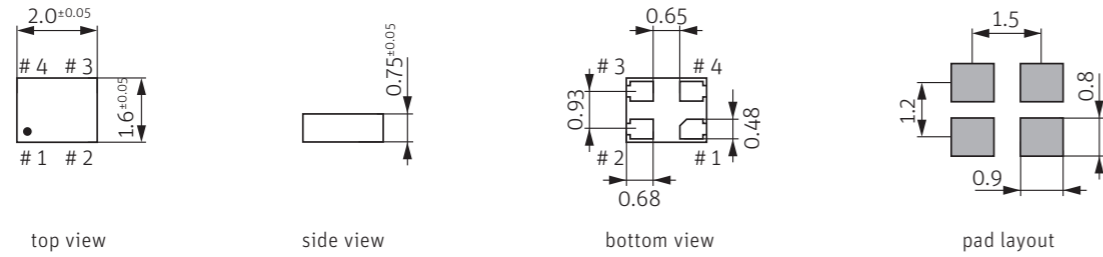


- edge control**
D = default
0 - 7, see table 4
- standby function options**
S = Stop
T = TriState
N = None
- temperature range**
T1 = -40°C ~ +85°C
T2 = -40°C ~ +105°C
T3 = -40°C ~ +125°C
T8 = -55°C ~ +125°C
- supply voltage**
3.3 = 3.3 V 2.5 = 2.5 V
3.0 = 3.0 V 1.8 = 1.8 V
2.8 = 2.8 V 2V3 = 2.5 V ~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

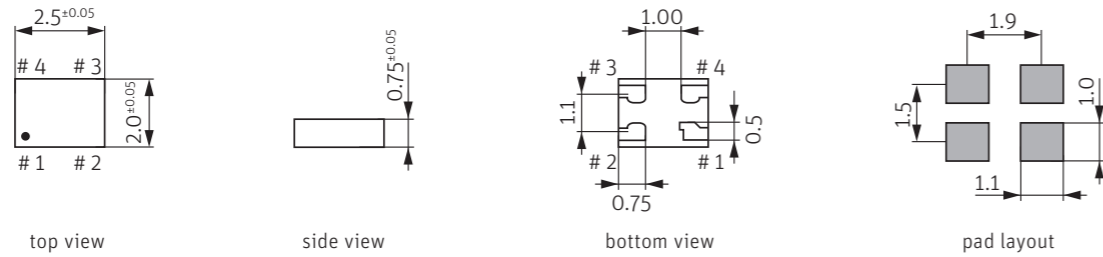


DIMENSIONS

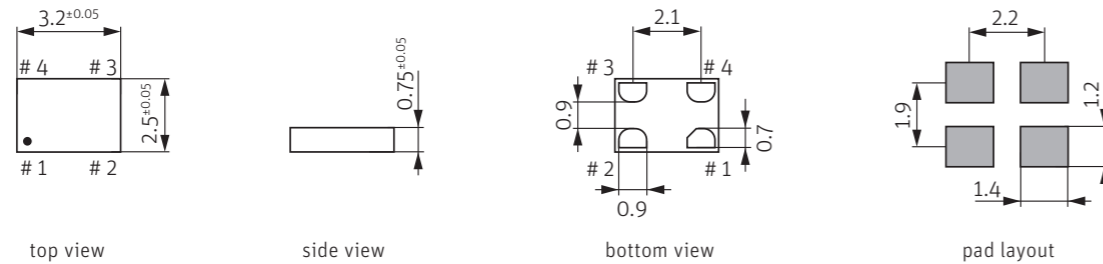
2.0 x 1.6 x 0.75
JSO21 LC / JSO21 AC



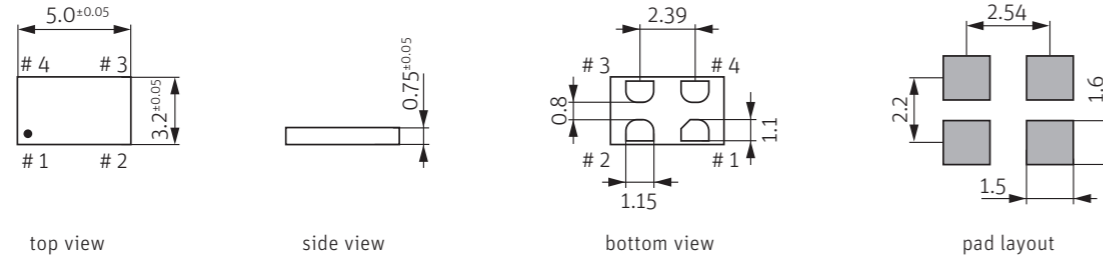
2.5 x 2.0 x 0.75
JSO22 LC / JSO22 AC



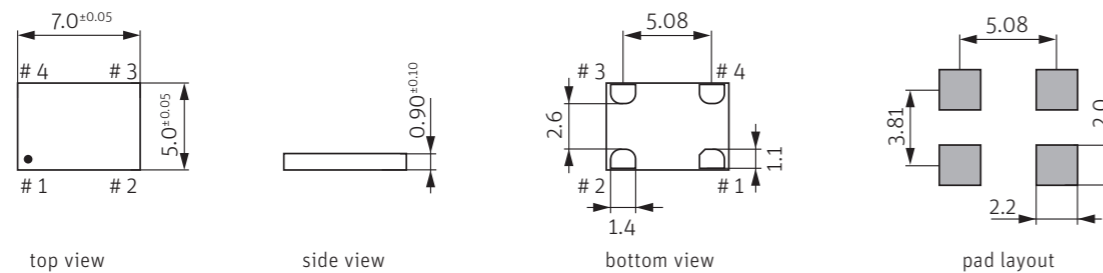
3.2 x 2.5 x 0.75
JSO32 LC / JSO32 AC



5.0 x 3.2 x 0.75
JSO53 LC / JSO53 AC



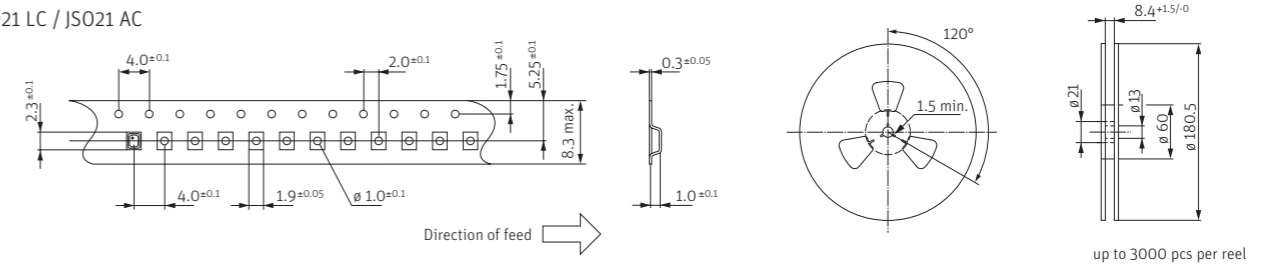
7.0 x 5.0 x 0.90
JSO75 LC / JSO75 AC



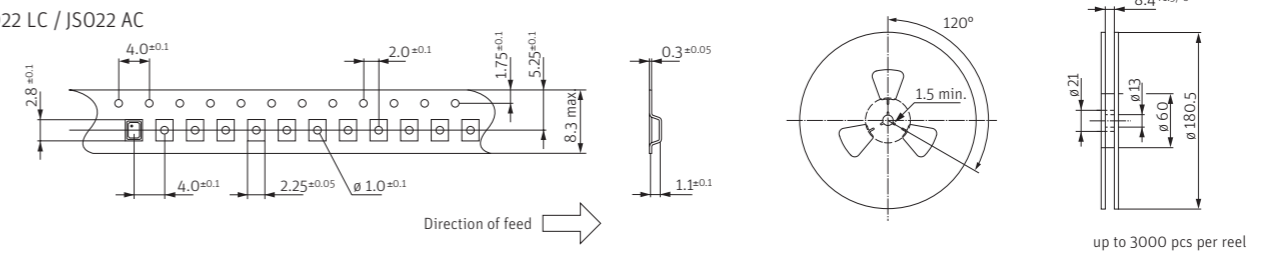
in mm
Pin connection # 1: e/d # 2: GND # 3: output # 4: V_{DC} note: a capacitor of 0.1 μF between V_{DC} and GND is recommended

TAPING SPECIFICATION

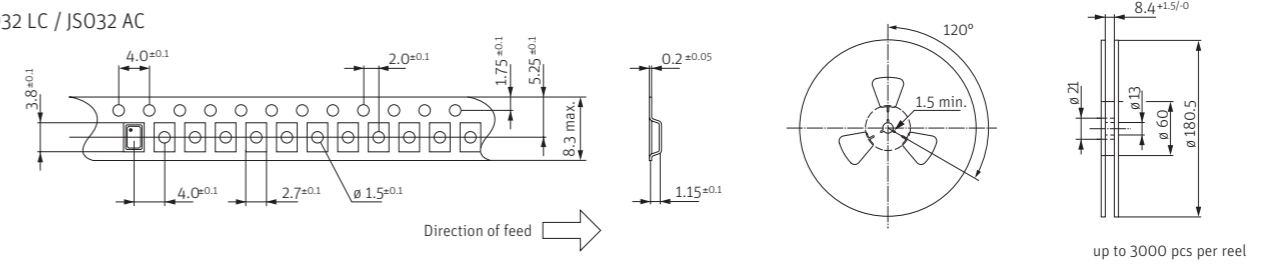
2.0 x 1.6 x 0.75
JSO21 LC / JSO21 AC



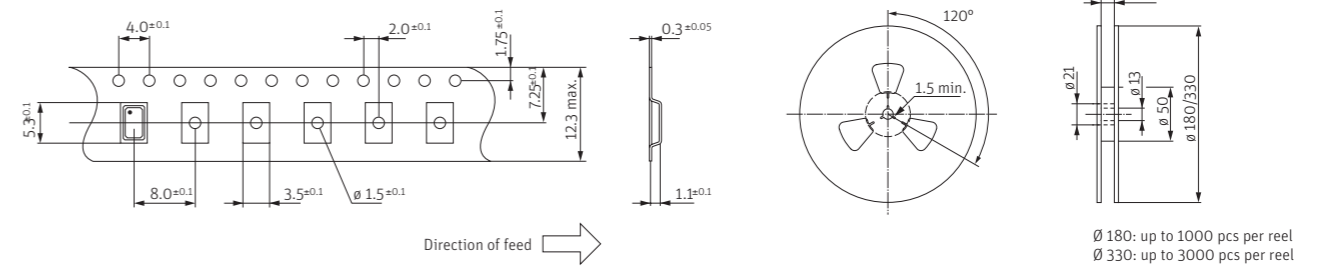
2.5 x 2.0 x 0.75
JSO22 LC / JSO22 AC



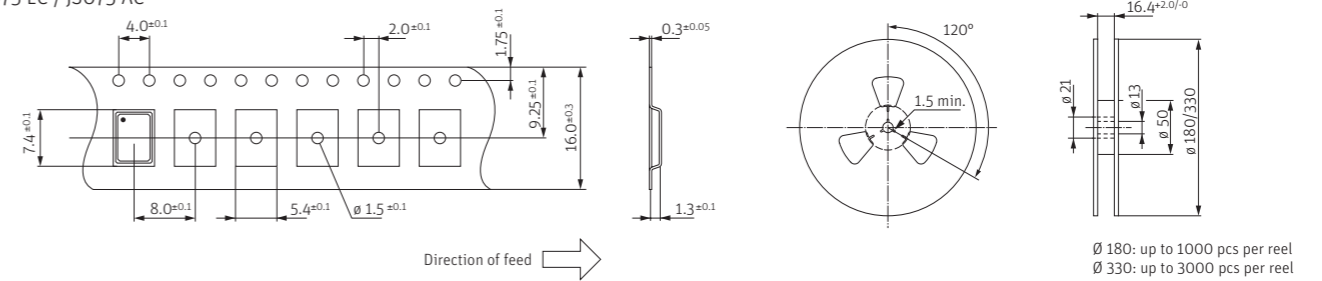
3.2 x 2.5 x 0.75
JSO32 LC / JSO32 AC



5.0 x 3.2 x 0.75
JSO53 LC / JSO53 AC



7.0 x 5.0 x 0.90
JSO75 LC / JSO75 AC



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.

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



Frequency Control and Battery Technology



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