



Automotive 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



RoHS compliant



Pb free



REACH compliant



Conflict mineral free

actual size



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 | 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. | | 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.

PACKAGING 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* | | B ±50 ppm | G ±30 ppm | C ±25 ppm | D ±20 ppm | AEC-Q100 Grade |
|------------------------------|----|--------------|--------------|--------------|--------------|-------------------|
| -40°C ~ +85°C | T1 | ○ | ○ | ○ | ○ | 3 |
| -40°C ~ +105°C | T2 | ○ | ○ | ○ | ○ | 2 |
| -40°C ~ +125°C | T3 | ○ | ○ | ○ | ○ | 1 |
| -55°C ~ +125°C | T8 | ○ | ○ | ○ | ○ | |

○ 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" ($V_{IL} \leq 0.2 V_{DC}$) | S = Stop | output weakly pulled down, oscillator in sleep mode |
| | T = TriState | output high impedance, oscillator operates |
| | N = None | oscillator output active |
| high "1" ($V_{IH} \geq 0.8 V_{DC}$) | all | oscillator output active |
| open* | all | oscillator output active |

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

PIN CONNECTION



B.C.E. S.r.l. - Via Regina Pacis, 54/c - Sassuolo (MO) - I 41049 - Italy
 Tel.: 0536 811616 - Fax: 0536 811500 - Web: www.bce.it - Email: bce@bce.it

Jauch MEMS – Uses SiTime's MEMS First™ technology

07092018

Jauch Quartz GmbH • e-mail: info@jauch.com • full data can be found under: www.jauch.com

All specifications are subject to change without notice



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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 | 1.0 | 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

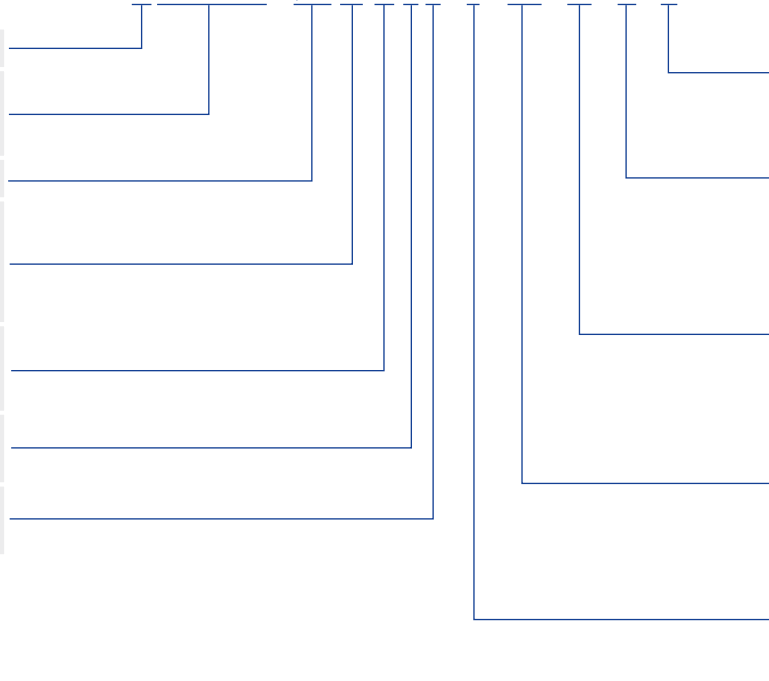
| operating temperature option | | operating temperature option | |
|------------------------------|----------|------------------------------|----------|
| T2 - (-40°C ~ +105°C) | | T8 - (-55°C ~ +125°C) | |
| T3 - (-40°C ~ +125°C) | | | |
| from (MHz) | to (MHz) | from (MHz) | to (MHz) |
| 61.223 | 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 = 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 - 3.3 - 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 |

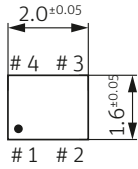
B.C.E. S.r.l. - Via Regina Pacis, 54/c - Sassuolo (MO) - I 41049 - Italy
Tel.: 0536 811616 - Fax: 0536 811500 - Web: www.bce.it - E-mail: bce@bce.it

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DIMENSIONS

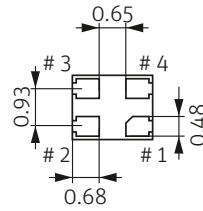
2.0 x 1.6 x 0.75
JSO21 AC



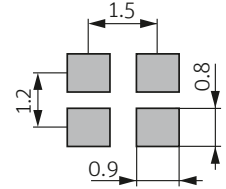
top view



side view

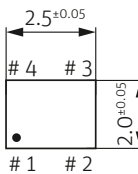


bottom view



pad layout

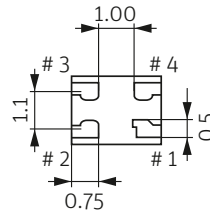
2.5 x 2.0 x 0.75
JSO22 AC



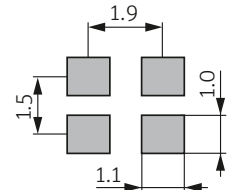
top view



side view

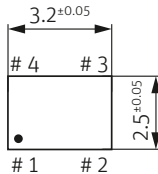


bottom view

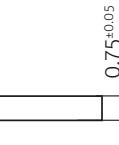


pad layout

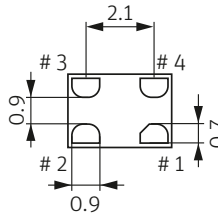
3.2 x 2.5 x 0.75
JSO32 AC



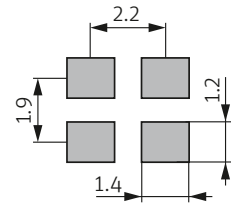
top view



side view

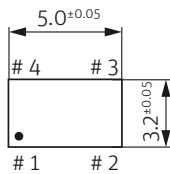


bottom view



pad layout

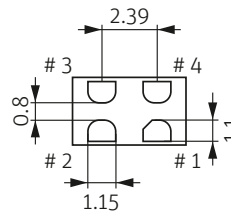
5.0 x 3.2 x 0.75
JSO53 AC



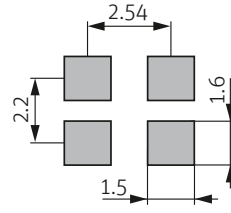
top view



side view

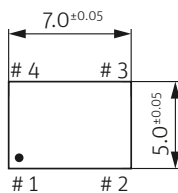


bottom view



pad layout

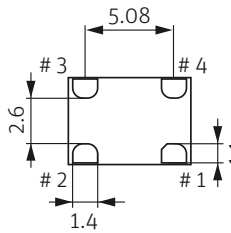
7.0 x 5.0 x 0.90
JSO75 AC



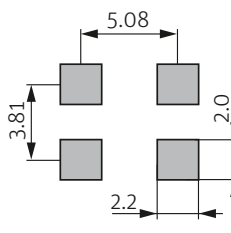
top view



side view



bottom view



pad layout

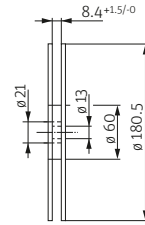
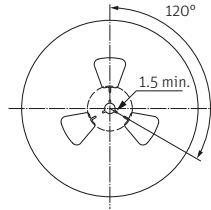
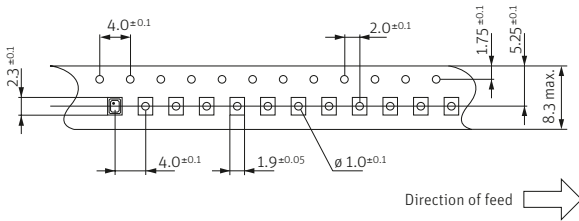
in mm

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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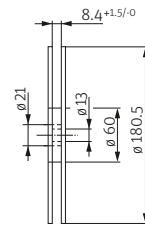
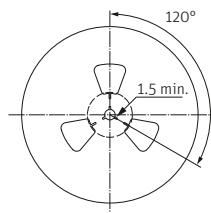
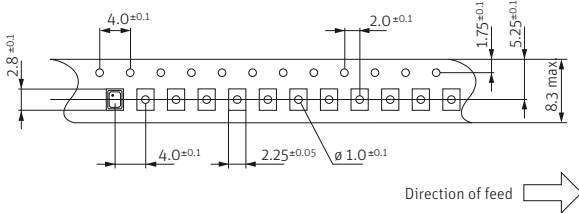
TAPING SPECIFICATION

2.0 x 1.6 x 0.75
JSO21 AC



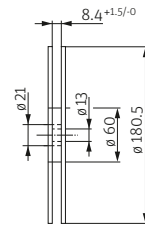
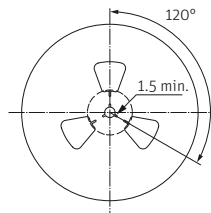
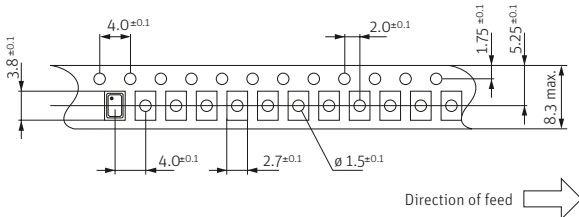
up to 3000 pcs per reel

2.5 x 2.0 x 0.75
JSO22 AC



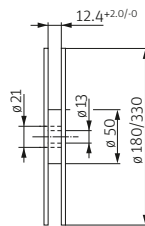
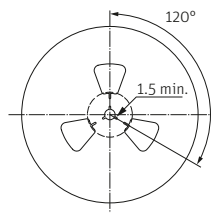
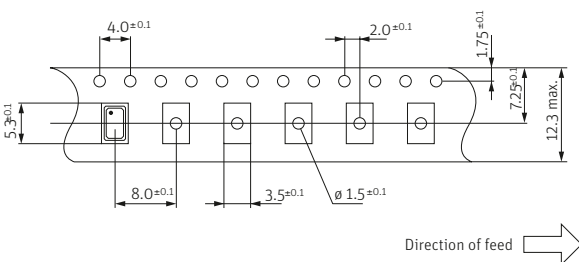
up to 3000 pcs per reel

3.2 x 2.5 x 0.75
JSO32 AC



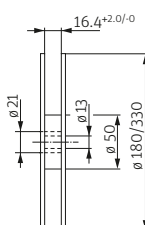
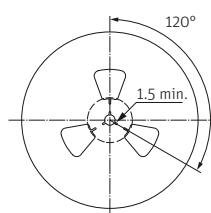
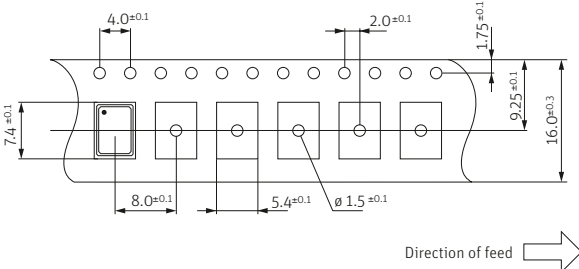
up to 3000 pcs per reel

5.0 x 3.2 x 0.75
JSO53 AC



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 AC



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