# Automotive and Industrial Grade SMD Crystal Oscillator




## ASDAIG

**2.50 x 2.00 x 0.95mm**
**RoHS/RoHS II Compliant**
**MSL = N/A: Not Applicable**

### Features

- AEC-Q200 Qualified
- Automotive Grade 1: -40°C to +125°C
- TS16949 Production Line Certified
- PPAP Available Upon Request
- Hermetically Seam-sealed Ceramic Package
- RoHS/RoHS II Compliant and Pb free

### Applications

- Infotainment Systems
- Keyless Entry & Startup
- GPS & Navigation
- Comfort control
- ADAS (Advanced Driver Assistance Systems)
- Vehicle to Vehicle Communication
- LiDAR (Light Detection and Ranging)
- In-vehicle Networking
- Powertrain & Drive Control
- Power Control & Conversion
- Industrial Control & Automation

### Part Identification (left blank if standard)

**ASDAIG ▢ - ▢▢▢▢▢ MHz - ▢ - ▢ - ▢ - ▢**

| Supply Voltage |
|---|
| Blank: 3.3V±5% |
| 1: 3.0V±5% |
| 2: 2.5V±5% |
| 3: 1.8V±5% |
| 5: 1.8V±5% ~ 3.3±5% |

| Freq. in MHz |
|---|
| e.g. 24.576MHz<br>14.31818MHz<br>26.000MHz |

| Operating Temp. |
|---|
| Blank: -40°C to +125°C |
| N: -30°C to +85°C |
| L: -40°C to +85°C |
| X: -40°C to +105°C |

| Overall Freq. Stability |
|---|
| Blank: ± 100 ppm |
| R: ± 150 ppm |
| C: ± 50 ppm |
| P: ± 45 ppm (*) |
| F: ± 40 ppm (*) |
| H: ± 35 ppm (*) |
| K: ± 30 ppm (*) |
| W: ± 25 ppm (*) |
| X: ± 20 ppm (*) |

**(*) Contact Abracon for availability**

| Duty Cycle |
|---|
| Blank: 40/60% @1/2$V_{dd}$ |
| S: 45/55% @1/2$V_{dd}$ |

| Packaging |
|---|
| Blank: Bulk |
| T: 1k pcs / reel |
| T3: 3k pcs / reel |

ABRACON LLC
5101 Hidden Creek Ln Spicewood TX 78669
Phone: 512-371-6159 | Fax: 512-351-8858
For terms and conditions of sales, please visit:
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**REVISED**: 09.09.2019

ABRACON IS ISO9001-2015 CERTIFIED

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## Electrical Specifications

| Parameters | | Min. | Typ. | Max. | Unit | Notes |
|---|---|---|---|---|---|---|
| Frequency Range | | 1.25 | | 156.25 | MHz | |
| Operating Temperature Range | | -40 | | +125 | °C | Option "blank"; See options |
| Storage Temperature | | -55 | | +125 | °C | Option "X, blank, L, N" |
| Overall Frequency Stability [Note 1] | | -50 | | +50 | ppm | Option "C"; See options |
| | | -100 | | +100 | | Option "blank"; See options |
| | | -150 | | +150 | | Option "R"; See options |
| Supply Voltage ($V_{dd}$) | | +1.71 | +1.8 ~ +3.3 | +3.465 | V | Option "5" |
| | | +3.135 | +3.3 | +3.465 | | Option "blank" |
| | | +2.85 | +3.0 | +3.15 | | Option "1" |
| | | +2.375 | +2.5 | +2.625 | | Option "2" |
| | | +1.71 | +1.8 | +1.89 | | Option "3" |
| Supply Current ($I_{dd}$) into 15pF Load | $V_{dd}$ = 3.3 V | | 4.0 | 7.0 | mA | 1.250~39.999 MHz |
| | | | 9.0 | 13.0 | | 40.000~48.999 MHz |
| | | | 15.0 | 20.0 | | 49.000~156.000 MHz |
| | $V_{dd}$ = 3.0 V | | 3.5 | 6.0 | | 1.250~39.999 MHz |
| | | | 8.0 | 12.0 | | 40.000~48.999 MHz |
| | | | 15.0 | 20.0 | | 49.000~156.000 MHz |
| | $V_{dd}$ = 2.5 V | | 3.0 | 5.0 | | 1.250~39.999 MHz |
| | | | 7.0 | 10.0 | | 40.000~48.999 MHz |
| | | | 15.0 | 20.0 | | 49.000~156.000 MHz |
| | $V_{dd}$ = 1.8 V | | 2.0 | 4.0 | | 1.250~39.999 MHz |
| | | | 4.0 | 7.0 | | 40.000~48.999 MHz |
| | | | 10.0 | 15.0 | | 49.000~156.000 MHz |
| Disable Current | | | | 10.0 | µA | |
| Output Load | | | | 15 | pF | CMOS |
| Output Voltage | $V_{OH}$ | 0.9*$V_{dd}$ | | | V | |
| | $V_{OL}$ | | | 0.1*$V_{dd}$ | | |
| Tri-state function | | "1" (VIH≥0.7*Vdd) or Open: Oscillation; "0" (VIH<0.3*Vdd): No oscillation/Hi Z | | | | |
| Aging | | -2.0 | | +2.0 | ppm | @25°C± 3°C First year |
| Symmetry @1/2$V_{dd}$ | | 40 | 50 | 60 | % | Option "blank" |
| | | 45 | 50 | 55 | | Option "S" |
| Start-up Time | | | 2.0 | 5.0 | ms | |
| Rise/Fall Time (Tr/Tf) | $V_{dd}$ = 3.3 V | | 2.5 | 6 | ns | 1.250~39.999 MHz |
| | | | 2 | 4 | | 40.000~156.000 MHz |
| | $V_{dd}$ = 3.0 V | | 2.5 | 6 | ns | 1.250~39.999 MHz |
| | | | 2 | 4 | | 40.000~156.000 MHz |
| | $V_{dd}$ = 2.5 V | | 3 | 7 | ns | 1.250~39.999 MHz |
| | | | 2.5 | 5 | | 40.000~156.000 MHz |
| | $V_{dd}$ = 1.8 V | | 3.5 | 8 | ns | 1.250~39.999 MHz |
| | | | 3 | 6 | | 40.000~156.000 MHz |

Note 1: Inclusive of initial tolerance at time of shipment, changes in supply voltage, load, temperature and 1st year

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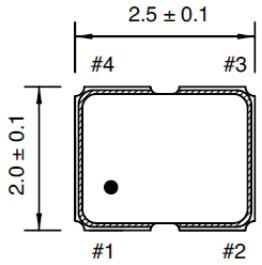

ASDAIG

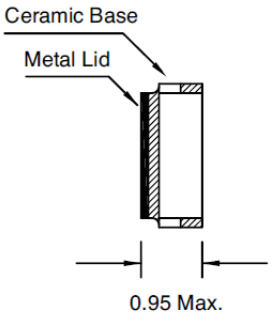
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**RoHS/RoHS II Compliant**
**MSL = N/A: Not Applicable**

## Electrical Specifications Cont.

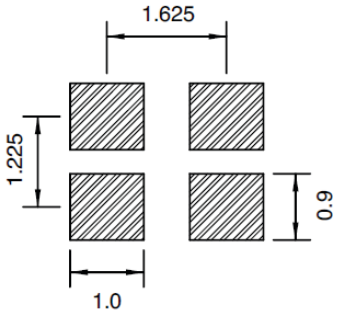
| Parameters | | Min. | Typ. | Max. | Unit | Notes |
|---|---|---|---|---|---|---|
| RMS Phase Jitter @ +25°C (10-39MHz: 12kHz to 5MHz) (>39MHz: 12kHz to 20MHz) | $V_{dd}$ = 3.3 V | | 0.5 | < 1.0 | ps | |
| | $V_{dd}$ = 3.0 V | | 0.5 | < 1.0 | | |
| | $V_{dd}$ = 2.5 V | | 0.5 | < 1.0 | | |
| | $V_{dd}$ = 1.8 V | | 0.5 | < 1.0 | | |
| Period Jitter RMS | $V_{dd}$ = 3.3 V | | 3.0 | 5.0 | ps | |
| | $V_{dd}$ = 3.0 V | | 3.0 | 5.0 | | |
| | $V_{dd}$ = 2.5 V | | 3.0 | 5.0 | | |
| | $V_{dd}$ = 1.8 V | | 3.0 | 5.0 | | |

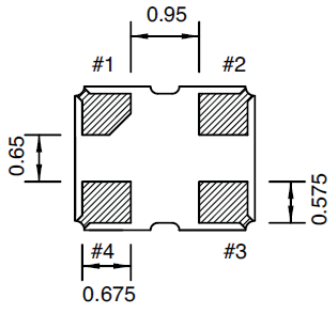
## Mechanical Dimensions




Recommended Land Pattern




| Pin # | Function |
|---|---|
| 1 | Tri-state |
| 2 | GND/Case |
| 3 | Output |
| 4 | $V_{dd}$ |

Note: Recommend using an approximately 0.01uF bypass capacitor between PIN 2 and PIN 4

**Dimensions: mm**

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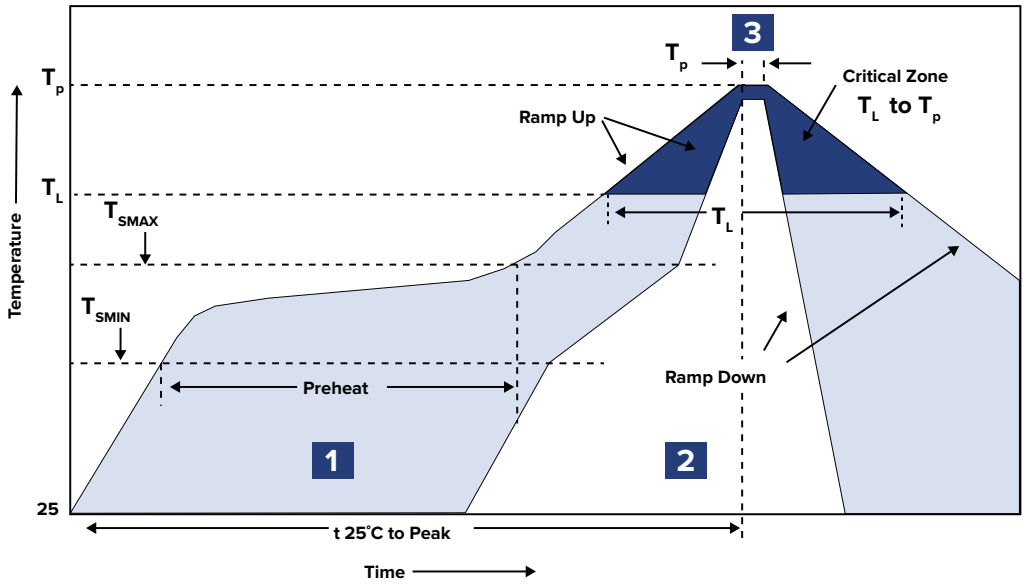
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## Reflow Profile




| Zone | Description | Temperature | Time |
|---|---|---|---|
| 1 | Preheat / Soak | $T_{SMIN}$ ~ $T_{SMAX}$<br>150°C ~ 180°C | 60 ~ 120 sec. |
| 2 | Reflow | $T_L$<br>230°C | 30 ~ 40 sec. |
| 3 | Peak heat | $T_P$<br>260°C±5°C | 5 sec. MAX |

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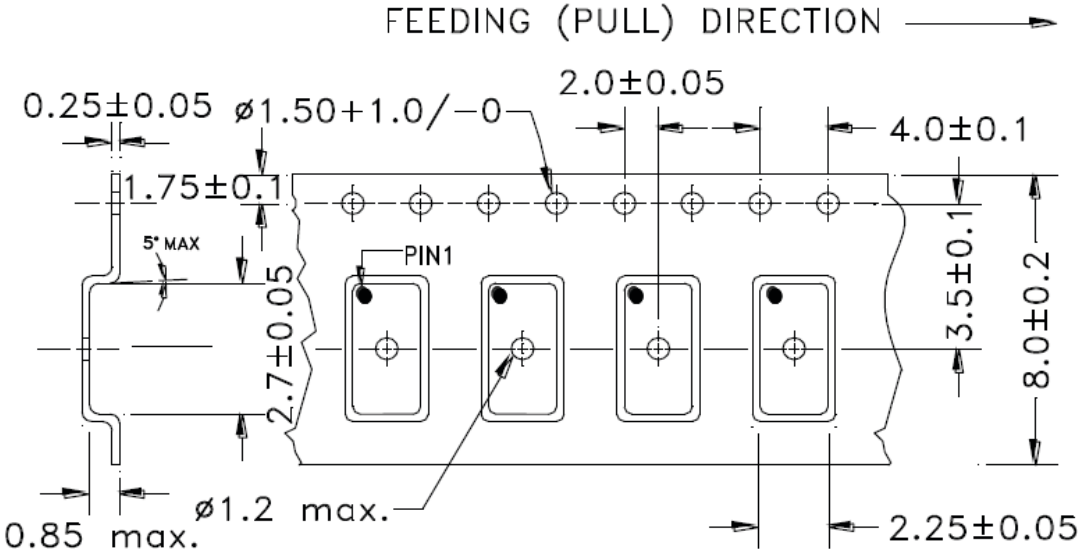


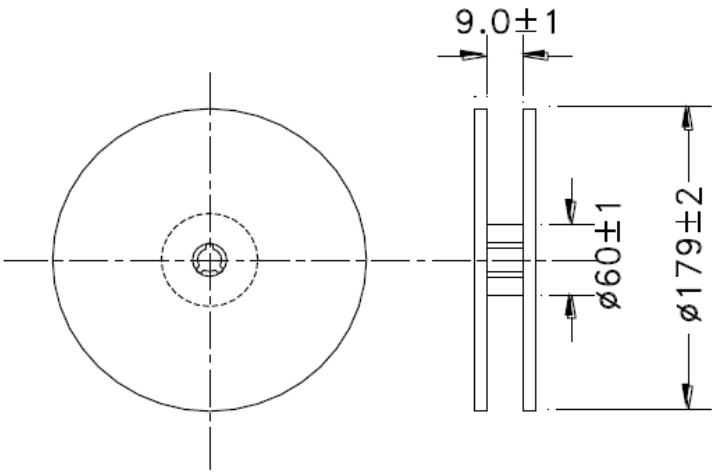

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## Packaging

Tape and Reel:
T: 1,000pcs/reel
T3: 3,000pcs/reel




**Dimensions: mm**

ATTENTION: Abracon LLC's products are COTS – Commercial-Off-The-Shelf products; suitable for Commercial, Industrial and, where designated, Automotive Applications. Abracon's products are not specifically designed for Military, Aviation, Aerospace, Life-dependent Medical applications or any application requiring high reliability where component failure could result in loss of life and/or property. For applications requiring high reliability and/or presenting an extreme operating environment, written consent and authorization from Abracon LLC is required. Please contact Abracon LLC for more information.

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