

# PLASTIC PACKAGE INDUSTRIAL GRADE ULTRA MINIATURE PURE SILICON™ CLOCK OSCILLATOR

ASVMB



7.0 x 5.0 x 0.85 mm

ASVMB



RoHS  
Compliant

## FEATURES:

- Ultra Miniature Pure Silicon™ Clock Oscillator
- 2nd Generation MEMS Technology with reduced jitter by Discera
- Low Power Consumption <10mA
- Exceptional Stability +/- 10ppm Over Temp. at -40 to +105°C, +/- 5ppm over -40 to +85°C
- Available in 30kG Shock Resistance Configuration
- Compact QFN Plastic Packaging

## APPLICATIONS:

- CCD Clock for VTR Camera
- Equipment Connected to PCs
- Low Profile Equipment
- Computers and Peripherals
- Lower Cost Crystal Oscillator Replacement
- Portable Electronics (MP3 Players, Games)
- Consumer Electronics such as TV's, DVR's, etc.
- Vibrant, Shock-Prone & Humid Environments for Industrial Equipment
- Demanding Military & Automotive Electronics

**MEMS  
TECHNOLOGY**

## STANDARD SPECIFICATIONS:

### Common Key Electrical Specifications

| Parameters                      | Minimum  | Typical | Maximum       | Units    | Notes       |
|---------------------------------|--|---------|---------------|----------|-------------|
| Frequency Range:                | 1.0  | -----   | 150           | MHz      |             |
| Operating Temperature:          | 0  | -----   | +70           | °C       | See options |
| Storage Temperature:            | -55  | -----   | +150          | °C       |             |
| Overall Frequency Stability*:   | -50  | -----   | +50           | ppm      | See options |
| Supply Voltage (Vdd):           | +1.8 ~ +3.3  |         |               | V        |             |
| Output Load:                    | 10   |         | 15, 25, or 40 | pF<br>kΩ | See options |
| Symmetry:                       | 45   |         | 55            | %        | @1/2Vdd     |
| Startup Time:                   |  | 1.5     | 3.0           | ms       |             |
| Disable Time:                   |  | 20      | 100           | ns       |             |
| Disable Stand-by Current:       |  |         | 15            | uA       |             |
| Tri-state Function (Stand-by) : | "1" (VIH≥0.75*Vdd) or Open: Oscillation<br>"0" (VIH<0.25*Vdd) : Hi Z |         |               | V        |             |
| Aging:                          | -5.0   | -----   | +5.0          | ppm      | First year  |

### Key Electrical Specifications – Vdd = 1.8V

| Parameters                | Minimum             | Typical            | Maximum | Units              | Notes            |                     |
|---------------------------|---------------------|--------------------|---------|--------------------|------------------|---------------------|
| Supply Current (no load): | 1.0 to 39.9999MHz   | -----              | 5       | 15                 | mA               | CL=0pF              |
|                           | 40.0 to 79.9999MHz  | -----              | 6       | 15                 | mA               | RL=∞                |
|                           | 80.0 to 124.9999MHz | -----              | 7       | 15                 | mA               | T=25°C              |
|                           | 125.0 to 150MHz     | -----              | 8       | 15                 | mA               | (Standard CL: 15pF) |
|                           | 1.0 to 39.9999MHz   | -----              | 6       | 15                 | mA               | CL=0pF              |
|                           | 40.0 to 79.9999MHz  | -----              | 7       | 15                 | mA               | RL=∞                |
|                           | 80.0 to 124.9999MHz | -----              | 8       | 15                 | mA               | T=25°C              |
|                           | 125.0 to 150MHz     | -----              | 9       | 15                 | mA               | (CL option: 25pF)   |
| Output Voltage:           | V <sub>OH</sub>     | 0.8*V <sub>d</sub> | -----   | -----              | V                |                     |
|                           | V <sub>OL</sub>     | -----              | -----   | 0.2*V <sub>d</sub> | V                | CL=15, 25, 40pF     |
| Rise Time:<br>Fall Time:  | Tr                  | -----              | 1.8     | 3.0                | ns               | CL=15pF; T=25°C     |
|                           | Tf                  | -----              | 1.0     | 3.0                | ns               | 20%/80%*VDD         |
|                           | Tr                  | -----              | 1.5     | 3.0                | ns               | CL=25pF; T=25°C     |
|                           | Tf                  | -----              | 1.2     | 3.0                | ns               | 20%/80%*VDD         |
| Cycle to Cycle Jitter:    | Tr                  | -----              | 1.4     | 3.0                | ns               | CL=40pF; T=25°C     |
|                           | Tf                  | -----              | 1.1     | 3.0                | ns               | 20%/80%*VDD         |
|                           |                     | -----              | 100     | -----              | ps               | F=100MHz CL=15pF    |
| Period Jitter RMS:        |                     | -----              | 55      | -----              | ps               | F=100MHz CL=25pF    |
|                           |                     | -----              | 55      | -----              | ps               | F=100MHz CL=40pF    |
|                           |                     | -----              | 12      | -----              | ps               | F=100MHz CL=15pF    |
|                           | -----               | 10                 | -----   | ps                 | F=100MHz CL=25pF |                     |
|                           | -----               | 10                 | -----   | ps                 | F=100MHz CL=40pF |                     |

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## Key Electrical Specifications – $V_{dd} = 2.5V$

| Parameters                   |                              | Minimum             | Typical | Maximum        | Units | Notes   |   |
|------------------------------|------------------------------|---------------------|---------|----------------|-------|---|---|
| Supply Current<br>(no load): | 1.0 to 39.9999MHz            | -----               | 6       | 15             | mA    | CL=0pF<br>RL=∞<br>T=25°C<br>(Standard CL: 15pF) |   |
|                              | 40.0 to 79.9999MHz           | -----               | 7       | 15             | mA    |   |   |
|                              | 80.0 to 124.9999MHz          | -----               | 8       | 15             | mA    |   |   |
|                              | 125.0 to 150MHz              | -----               | 9       | 15             | mA    |   |   |
|                              | Supply Current<br>(no load): | 1.0 to 39.9999MHz   | -----   | 7              | 15    | mA  | CL=0pF<br>RL=∞<br>T=25°C<br>(CL option: 25pF) |
|                              |                              | 40.0 to 79.9999MHz  | -----   | 8              | 15    | mA  |   |
|                              |                              | 80.0 to 124.9999MHz | -----   | 9              | 15    | mA  |   |
|                              |                              | 125.0 to 150MHz     | -----   | 10             | 15    | mA  |   |
| Supply Current<br>(no load): | 1.0 to 39.9999MHz            | -----               | 8       | 16             | mA    | CL=0pF<br>RL=∞<br>T=25°C<br>(CL option: 40pF)   |   |
|                              | 40.0 to 79.9999MHz           | -----               | 9       | 16             | mA    |   |   |
|                              | 80.0 to 124.9999MHz          | -----               | 10      | 16             | mA    |   |   |
|                              | 125.0 to 150MHz              | -----               | 11      | 16             | mA    |   |   |
| Output Voltage:              | $V_{OH}$                     | $0.8 * V_{dd}$      | -----   | -----          | V     | CL=15, 25pF                                     |   |
|                              | $V_{OL}$                     | -----               | -----   | $0.2 * V_{dd}$ | V     |   |   |
|                              | $V_{OH}$                     | $0.9 * V_{dd}$      | -----   | -----          | V     |   |   |
|                              | $V_{OL}$                     | -----               | -----   | $0.1 * V_{dd}$ | V     |   |   |
| Rise Time:<br>Fall Time:     | $T_r$                        | -----               | 1.0     | 2.0            | ns    | CL=15pF; T=25°C<br>20%/80%*VDD                  |   |
|                              | $T_f$                        | -----               | 0.9     | 2.0            | ns    |   |   |
|                              | $T_r$                        | -----               | 1.1     | 2.0            | ns    | CL=25pF; T=25°C<br>20%/80%*VDD                  |   |
|                              | $T_f$                        | -----               | 0.9     | 2.0            | ns    |   |   |
|                              | $T_r$                        | -----               | 1.0     | 2.0            | ns    | CL=40pF; T=25°C<br>20%/80%*VDD                  |   |
|                              | $T_f$                        | -----               | 0.9     | 2.0            | ns    |   |   |
| Period Jitter RMS:           |                              | -----               | 6.5     | -----          | ps    | F=100MHz CL=15pF                                |   |
|                              |                              | -----               | 5       | -----          |       | F=100MHz CL=25pF                                |   |
|                              |                              | -----               | 5       | -----          |       | F=100MHz CL=40pF                                |   |
| Cycle to Cycle Jitter:       |                              | -----               | 80      | -----          | ps    | F=100MHz CL=15pF                                |   |
|                              |                              | -----               | 40      | -----          |       | F=100MHz CL=25pF                                |   |
|                              |                              | -----               | 40      | -----          |       | F=100MHz CL=40pF                                |   |

## Key Electrical Specifications – $V_{dd} = 3.3V$

| Parameters                   |                              | Minimum             | Typical | Maximum        | Units | Notes   |   |
|------------------------------|------------------------------|---------------------|---------|----------------|-------|---|---|
| Supply Current<br>(no load): | 1.0 to 39.9999MHz            | -----               | 7       | 15             | mA    | CL=0pF<br>RL=∞<br>T=25°C<br>(Standard CL: 15pF) |   |
|                              | 40.0 to 79.9999MHz           | -----               | 8       | 15             | mA    |   |   |
|                              | 80.0 to 124.9999MHz          | -----               | 9       | 15             | mA    |   |   |
|                              | 125.0 to 150MHz              | -----               | 10      | 15             | mA    |   |   |
|                              | Supply Current<br>(no load): | 1.0 to 39.9999MHz   | -----   | 8              | 16    | mA  | CL=0pF<br>RL=∞<br>T=25°C<br>(CL option: 25pF) |
|                              |                              | 40.0 to 79.9999MHz  | -----   | 9              | 16    | mA  |   |
|                              |                              | 80.0 to 124.9999MHz | -----   | 10             | 16    | mA  |   |
|                              |                              | 125.0 to 150MHz     | -----   | 11             | 16    | mA  |   |
| Supply Current<br>(no load): | 1.0 to 39.9999MHz            | -----               | 8       | 16             | mA    | CL=0pF<br>RL=∞<br>T=25°C<br>(CL option: 40pF)   |   |
|                              | 40.0 to 79.9999MHz           | -----               | 9       | 16             | mA    |   |   |
|                              | 80.0 to 124.9999MHz          | -----               | 10      | 16             | mA    |   |   |
|                              | 125.0 to 150MHz              | -----               | 11      | 16             | mA    |   |   |
| Output Voltage:              | $V_{OH}$                     | $0.8 * V_{dd}$      | -----   | -----          | V     | CL=15pF   |   |
|                              | $V_{OL}$                     | -----               | -----   | $0.2 * V_{dd}$ | V     |   |   |
|                              | $V_{OH}$                     | $0.9 * V_{dd}$      | -----   | -----          | V     |   |   |
|                              | $V_{OL}$                     | -----               | -----   | $0.1 * V_{dd}$ | V     |   |   |
| Rise Time:<br>Fall Time:     | $T_r$                        | -----               | 1.0     | 2.0            | ns    | CL=15pF; T=25°C<br>20%/80%*VDD                  |   |
|                              | $T_f$                        | -----               | 0.9     | 2.0            | ns    |   |   |
|                              | $T_r$                        | -----               | 1.0     | 2.0            | ns    | CL=25pF; T=25°C<br>20%/80%*VDD                  |   |
|                              | $T_f$                        | -----               | 0.9     | 2.0            | ns    |   |   |
|                              | $T_r$                        | -----               | 0.8     | 2.0            | ns    | CL=40pF; T=25°C<br>20%/80%*VDD                  |   |
|                              | $T_f$                        | -----               | 0.8     | 2.0            | ns    |   |   |
| Period Jitter RMS:           |                              | -----               | 6       | -----          | ps    | F=100MHz CL=15pF                                |   |
|                              |                              | -----               | 5       | -----          |       | F=100MHz CL=25pF                                |   |
|                              |                              | -----               | 5       | -----          |       | F=100MHz CL=40pF                                |   |
| Cycle to Cycle Jitter:       |                              | -----               | 80      | -----          | ps    | F=100MHz CL=15pF                                |   |
|                              |                              | -----               | 40      | -----          |       | F=100MHz CL=25pF                                |   |
|                              |                              | -----               | 40      | -----          |       | F=100MHz CL=40pF                                |   |

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## Absolute Maximum Ratings

| Item            | Minimum | Maximum              | Unit | Condition |
|-----------------|---------|----------------------|------|-----------|
| Supply Voltage  | -0.3    | +4.0                 | V    |           |
| Input Voltage   | -0.3    | V <sub>dd</sub> +0.3 | V    |           |
| Junction Temp.  | -----   | +150                 | °C   |           |
| Storage Temp.   | -55     | +150                 | °C   |           |
| Soldering Temp. | -----   | +260                 | °C   | 40sec max |
| ESD             |         |                      | V    |           |
| HBM             |         | 4,000                |      |           |
| MM              |         | 200                  |      |           |
| CDM             |         | 1,500                |      |           |

## OPTIONS AND PART IDENTIFICATION: (Left Blank if Standard)

### Programmed Orders (Quantity > 1,000pcs)

ASVMB -  MHz -  -  -

| Frequency in MHz  | Operating Temp.   | Overall Freq. Stability                                  | Output Load                         | Packaging  |
|---|---|--|-------------------------------------|--|
| e.g. 14.3181 MHz<br>(Maximum 4 digits<br>after decimal) | Blank: 0°C ~ +70°C<br>E: -20°C ~ +70°C<br>L: -40°C ~ +85°C<br>X: -40°C ~ +105°C | C: ±50ppm (STD)<br>R5*: ±5ppm<br>Y: ±10ppm<br>R: ±25 ppm | Blank: 15pF<br>25: 25pF<br>40: 40pF | Blank: 50pcs / Tube<br>T: 1,000pcs / reel<br>T3: 3,000pcs / reel |

\*R5: ±5ppm stability is available by request. Please contact Abracon for more information.

### Un-Programmed Orders

Blank un-programmed oscillators and our low cost portable programmer are available for quick turn engineering requirements. Please call ABRACON or visit MEMSpeed Pro site <http://www.abracon.com/memspeedpro/memspeedpro.html> for more information.

ASVMB - BLANK -  -

| Operating Temp.   | Overall Freq. Stability                    | Packaging  |
|---|--|--|
| Blank: 0°C ~ +70°C<br>E: -20°C ~ +70°C<br>L: -40°C ~ +85°C<br>X: -40°C ~ +105°C | C: ±50ppm (STD)<br>Y: ±10ppm<br>R: ±25 ppm | Blank: 50pcs / Tube<br>T: 1,000pcs / reel<br>T3: 3,000pcs / reel |

Note: Available 15pF output load only for ASVMB blank MEMS oscillator

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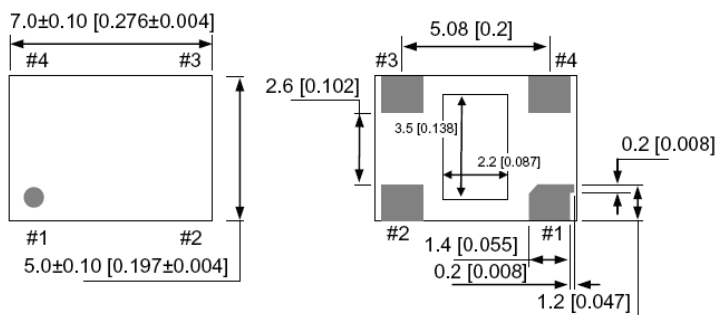
7.0 x 5.0 x 0.85 mm

ASVMB



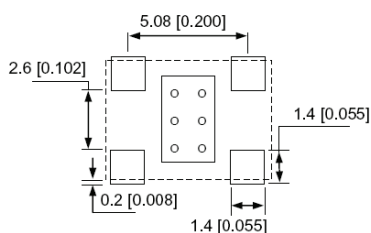
RoHS  
Compliant

## OUTLINE DIMENSIONS:



| No. | Pin Terminal |
|-----|--------------|
| 1   | Standby      |
| 2   | GND          |
| 3   | Output       |
| 4   | VDD          |

### Recommended Land Pattern



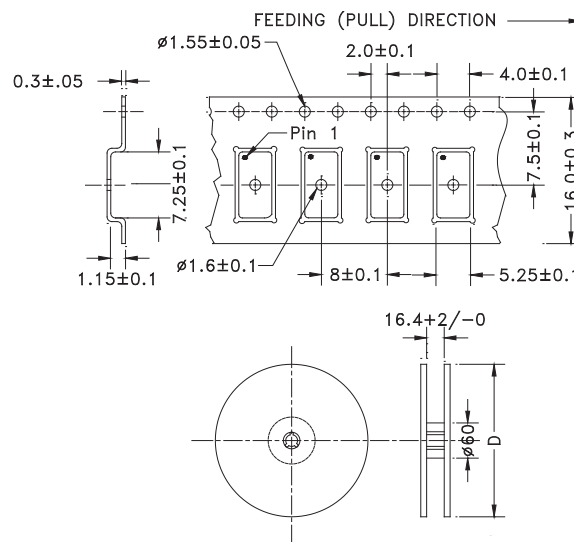
Note: Recommend using an approximately 0.01uF bypass capacitor between PIN 2 and 4.

Dimensions: mm (inches)

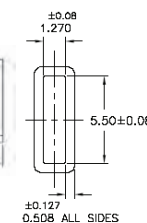
## TAPE AND REEL:

T= 1,000pcs/reel (D=180mm)

T3= 3,000pcs/reel (D=330mm)



Tube: 50 pcs/tube

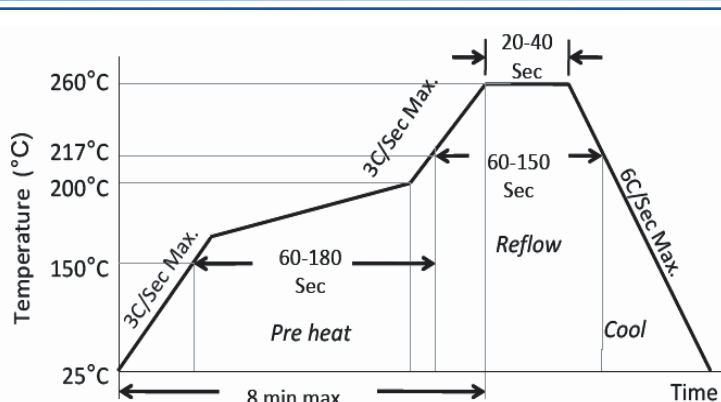


Unit orientation in tube:



Dimensions: mm

## REFLOW PROFILE:



|                                   |              |
|-----------------------------------|--------------|
| Ramp-Up Rate (200°C to Peak Temp) | 3°C/Sec Max. |
| Preheat Time 150°C to 200°C       | 60-180 Sec   |
| Time maintained above 217°C       | 60-150 Sec   |
| Peak Temperature                  | 255-260°C    |
| Time within 5°C of actual Peak    | 20-40 Sec    |
| Ramp-Down Rate                    | 6°C/Sec Max. |
| Time 25°C to Peak Temperature     | 8 min Max.   |

**ATTENTION:** Abracon Corporation'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-dependant 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 Corporation is required. Please contact Abracon Corporation for more information.

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Компания «ЭлектроПласт» предлагает заключение долгосрочных отношений при поставках импортных электронных компонентов на взаимовыгодных условиях!

Наши преимущества:

- Оперативные поставки широкого спектра электронных компонентов отечественного и импортного производства напрямую от производителей и с крупнейших мировых складов;
- Поставка более 17-ти миллионов наименований электронных компонентов;
- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
- Экспресс доставка в любую точку России;
- Техническая поддержка проекта, помощь в подборе аналогов, поставка прототипов;
- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
- Лицензия ФСБ на осуществление работ с использованием сведений, составляющих государственную тайну;
- Поставка специализированных компонентов (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Aeroflex, Peregrine, Syfer, Eurofarad, Texas Instrument, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits, General Dynamics и др.);

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- Подбор оптимального решения, техническое обоснование при выборе компонента;
- Подбор аналогов;
- Консультации по применению компонента;
- Поставка образцов и прототипов;
- Техническая поддержка проекта;
- Защита от снятия компонента с производства.



#### Как с нами связаться

**Телефон:** 8 (812) 309 58 32 (многоканальный)

**Факс:** 8 (812) 320-02-42

**Электронная почта:** [org@eplast1.ru](mailto:org@eplast1.ru)

**Адрес:** 198099, г. Санкт-Петербург, ул. Калинина, дом 2, корпус 4, литера А.