

# MEMS CLOCK OSCILLATOR

ASDMB



Life Size   
2.5 x 2.0 x 0.85 mm

ASDMB

Moisture Sensitivity Level – MSL 1



RoHS/RoHS II Compliant

## FEATURES:

- Low Power Consumption <10mA
- Exceptional Stability +/- 10ppm Over Temp. at -40 to +105°C
- 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

## STANDARD 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 (V <sub>dd</sub> ): | +1.8 ~ +3.3                                                                                    |         |               | V        |                     |
| Output Load:                       | 10                                                                                             |         | 15, 25, or 40 | pF<br>kΩ | See options         |
| Symmetry:                          | 45                                                                                             |         | 55            | %        | @1/2V <sub>dd</sub> |
| 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*V <sub>dd</sub> ) or Open: Oscillation<br>"0" (VIL<0.25*V <sub>dd</sub> ) : Hi Z |         |               | V        |                     |
| Aging:                             | -5.0                                                                                           |         | +5.0          | ppm      | First year          |

## Key Electrical Specifications – V<sub>dd</sub>= 1.8V

| Parameters                | Minimum             | Typical             | Maximum             | Units | Notes               |
|---------------------------|---------------------|---------------------|---------------------|-------|---------------------|
| Supply Current (no load): | 1.0 to 39.9999MHz   | 5                   | 15                  | mA    | CL=0p               |
|                           | 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=0p               |
|                           | 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)   |
|                           | 1.0 to 39.9999MHz   | 7                   | 15                  | mA    | CL=0p               |
|                           | 40.0 to 79.9999MHz  | 8                   | 15                  | mA    | RL=∞                |
|                           | 80.0 to 124.9999MHz | 9                   | 15                  | mA    | T=25°C              |
|                           | 125.0 to 150MHz     | 10                  | 15                  | mA    | (CL option: 40pF)   |
| Output Voltage:           | V <sub>OH</sub>     | 0.8*V <sub>dd</sub> |                     | V     |                     |
|                           | V <sub>OL</sub>     |                     | 0.2*V <sub>dd</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         |
|                           | Tr                  | 1.4                 | 3.0                 | ns    | CL=40pF; T=25°C     |
|                           | Tf                  | 1.1                 | 3.0                 | ns    | 20%/80%*VDD         |
| Cycle to Cycle Jitter:    |                     | 60                  |                     | ps    | F=100MHz            |
| Period Jitter RMS:        |                     | 10                  |                     | ps    | F=100MHz            |



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REVISED: 12.10.2018

ABRACON IS  
ISO9001-2015  
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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              |
|                              | 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    | (Standard CL: 15pF) |
|                              | 1.0 to 39.9999MHz   |                    | 7       | 15                 | mA    | CL=0pF              |
|                              | 40.0 to 79.9999MHz  |                    | 8       | 15                 | mA    | RL=∞                |
|                              | 80.0 to 124.9999MHz |                    | 9       | 15                 | mA    | T=25°C              |
|                              | 125.0 to 150MHz     |                    | 10      | 15                 | mA    | (CL option: 25pF)   |
|                              | 1.0 to 39.9999MHz   |                    | 8       | 16                 | mA    | CL=0pF              |
|                              | 40.0 to 79.9999MHz  |                    | 9       | 16                 | mA    | RL=∞                |
|                              | 80.0 to 124.9999MHz |                    | 10      | 16                 | mA    | T=25°C              |
|                              | 125.0 to 150MHz     |                    | 11      | 16                 | mA    | (CL option: 40pF)   |
| Output Voltage:              | $V_{OH}$            | $0.8 \cdot V_{dd}$ |         |                    | V     |                     |
|                              | $V_{OL}$            |                    |         | $0.2 \cdot V_{dd}$ | V     | CL=15, 25pF         |
|                              | $V_{OH}$            | $0.9 \cdot V_{dd}$ |         |                    | V     |                     |
|                              | $V_{OL}$            |                    |         | $0.1 \cdot V_{dd}$ | V     | CL=40pF             |
| Rise Time:<br>Fall Time:     | $T_r$               |                    | 1.0     | 2.0                | ns    | CL=15pF; T=25°C     |
|                              | $T_f$               |                    | 0.9     | 2.0                | ns    | 20%/80%*VDD         |
|                              | $T_r$               |                    | 1.1     | 2.0                | ns    | CL=25pF; T=25°C     |
|                              | $T_f$               |                    | 0.9     | 2.0                | ns    | 20%/80%*VDD         |
|                              | $T_r$               |                    | 1.0     | 2.0                | ns    | CL=40pF; T=25°C     |
|                              | $T_f$               |                    | 0.9     | 2.0                | ns    | 20%/80%*VDD         |
| Cycle to Cycle Jitter:       |                     |                    | 50      |                    | ps    | F=100MHz            |
| Period Jitter RMS:           |                     |                    | 5       |                    | ps    | F=100MHz            |

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=0p<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    |                                                |
|                              | 1.0 to 39.9999MHz   |                | 8       | 16             | mA    | CL=0p<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    |                                                |
|                              | 1.0 to 39.9999MHz   |                | 8       | 16             | mA    | CL=0p<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     | CL=25, 40pF                                    |
|                              | $V_{OL}$            |                |         | $0.1 * V_{dd}$ | V     |                                                |
| Rise Time:<br>Fall Time:     | Tr                  |                | 1.0     | 2.0            | ns    | CL=15pF; T=25°C<br>20%/80%*VDD                 |
|                              | Tf                  |                | 0.9     | 2.0            | ns    |                                                |
|                              | Tr                  |                | 1.0     | 2.0            | ns    | CL=25pF; T=25°C<br>20%/80%*VDD                 |
|                              | Tf                  |                | 0.9     | 2.0            | ns    |                                                |
|                              | Tr                  |                | 0.8     | 2.0            | ns    | CL=40pF; T=25°C<br>20%/80%*VDD                 |
|                              | Tf                  |                | 0.8     | 2.0            | ns    |                                                |
| Cycle to Cycle Jitter:       |                     |                | 50      |                | ps    | F=100MHz                                       |
| Period Jitter RMS:           |                     |                | 5       |                | ps    | F=100MHz                                       |



## 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 &gt; 1,000pcs)

ASDMB -  MHz -  -  - 

| Frequency in MHz                                        |
|---------------------------------------------------------|
| e.g. 14.3181 MHz<br>(Maximum 4 digits<br>after decimal) |

| Operating Temp.    |
|--------------------|
| Blank: 0°C ~ +70°C |
| E: -20°C ~ +70°C   |
| L: -40°C ~ +85°C   |
| X: -40°C ~ +105°C  |

| Overall Freq. Stability |
|-------------------------|
| C: ±50ppm (STD)         |
| Y: ±10ppm               |
| R: ±25 ppm              |

| Output Load |
|-------------|
| Blank: 15pF |
| 25: 25pF    |
| 40: 40pF    |

| Packaging             |
|-----------------------|
| Blank*: 140pcs / Tube |
| T: 1,000pcs / reel    |
| T3: 3,000pcs / reel   |
| T5: 5,000pcs / reel   |
| T10: 10,000pcs / reel |

\* For Quick turn-around programmable orders < 1000pcs: Due to the immediate availability of stock and the qty of the order, the parts may be delivered as BULK: Cut Tape, Loose parts in Antistatic Bag or in Tube(s). The MOQ per the series will still apply for Tube packaging.

## Un-Programmed Orders

Blank un-programmed oscillators are available for quick turn engineering requirements. Please call ABRACON for more information.

ASDMB - BLANK -  -  -  - 

| Operating Temp.    |
|--------------------|
| Blank: 0°C ~ +70°C |
| E: -20°C ~ +70°C   |
| L: -40°C ~ +85°C   |
| X: -40°C ~ +105°C  |

| Overall Freq. Stability |
|-------------------------|
| C: ±50ppm (STD)         |
| Y: ±10ppm               |
| R: ±25 ppm              |

| Output Load |
|-------------|
| Blank: 15pF |
| 25: 25pF    |
| 40: 40pF    |

| Packaging             |
|-----------------------|
| Blank: 140pcs / Tube  |
| T: 1,000pcs / reel    |
| T3: 3,000pcs / reel   |
| T5: 5,000pcs / reel   |
| T10: 10,000pcs / reel |

# MEMS CLOCK OSCILLATOR

ASDMB



Life Size

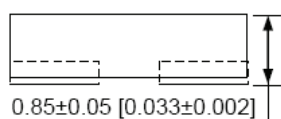
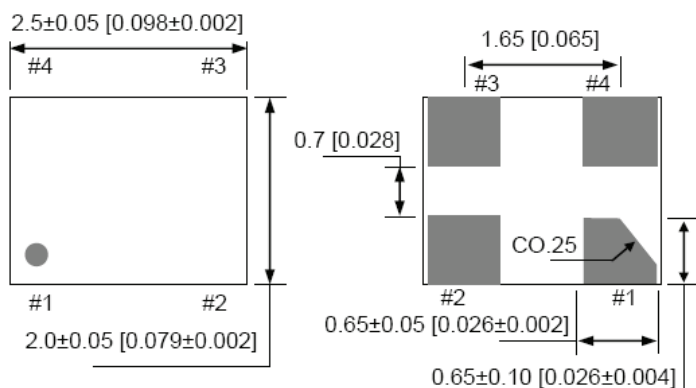
2.5 x 2.0 x 0.85 mm

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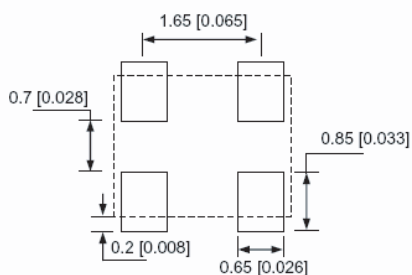
RoHS/RoHS II Compliant

## OUTLINE DIMENSIONS:



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

### Recommended Land Pattern

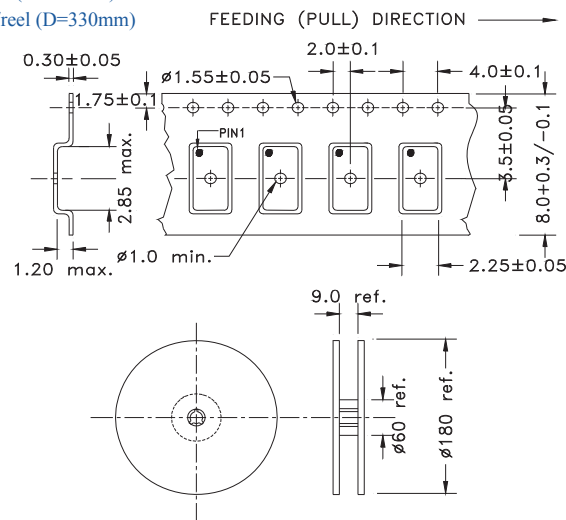


Note: Recommend using an approximately 0.01uF bypass capacitor between PIN 2 and 4.

Dimensions: mm (inches)

## TAPE AND REEL:

T= 1,000pcs/reel (D=180mm)  
T3= 3,000pcs/reel (D=180mm)  
T5= 5,000pcs/reel (D=330mm)  
T10= 10,000pcs/reel (D=330mm)



Tube: 140 pcs/tube

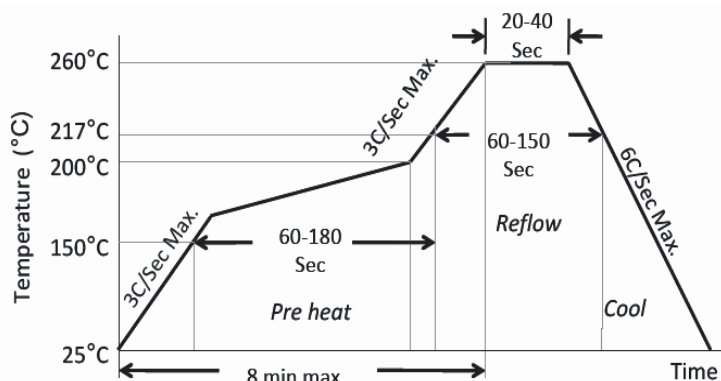


Unit orientation in tube:



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.   |



Need a test socket for the ASDMB Series? To view compatible **PRECISION TEST SOCKETS** for these parts, [click here](#).

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