

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 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 "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 _{OH} | 0.8*V _d | ----- | ----- | V | |
| | V _{OL} | ----- | ----- | 0.2*V _d | V | CL=15, 25, 40pF |
| Rise Time: 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 (no load): | 1.0 to 39.9999MHz | ----- | 6 | 15 | mA | CL=0pF RL=∞ T=25°C (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 | |
| | 1.0 to 39.9999MHz | ----- | 7 | 15 | mA | CL=0pF RL=∞ T=25°C (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 | |
| | 1.0 to 39.9999MHz | ----- | 8 | 16 | mA | CL=0pF RL=∞ T=25°C (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: Fall Time: | T_r | ----- | 1.0 | 2.0 | ns | CL=15pF; T=25°C 20%/80%*VDD |
| | T_f | ----- | 0.9 | 2.0 | ns | |
| | T_r | ----- | 1.1 | 2.0 | ns | CL=25pF; T=25°C 20%/80%*VDD |
| | T_f | ----- | 0.9 | 2.0 | ns | |
| | T_r | ----- | 1.0 | 2.0 | ns | CL=40pF; T=25°C 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 (no load): | 1.0 to 39.9999MHz | ----- | 7 | 15 | mA | CL=0pF RL=∞ T=25°C (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=0pF RL=∞ T=25°C (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=0pF RL=∞ T=25°C (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: Fall Time: | T_r | ----- | 1.0 | 2.0 | ns | CL=15pF; T=25°C 20%/80%*VDD |
| | T_f | ----- | 0.9 | 2.0 | ns | |
| | T_r | ----- | 1.0 | 2.0 | ns | CL=25pF; T=25°C 20%/80%*VDD |
| | T_f | ----- | 0.9 | 2.0 | ns | |
| | T_r | ----- | 0.8 | 2.0 | ns | CL=40pF; T=25°C 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 _{dd} +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 (Maximum 4 digits after decimal) | Blank: 0°C ~ +70°C E: -20°C ~ +70°C L: -40°C ~ +85°C X: -40°C ~ +105°C | C: ±50ppm (STD) R5*: ±5ppm Y: ±10ppm R: ±25 ppm | Blank: 15pF 25: 25pF 40: 40pF | Blank: 50pcs / Tube T: 1,000pcs / reel 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 E: -20°C ~ +70°C L: -40°C ~ +85°C X: -40°C ~ +105°C | C: ±50ppm (STD) Y: ±10ppm R: ±25 ppm | Blank: 50pcs / Tube T: 1,000pcs / reel T3: 3,000pcs / reel |

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

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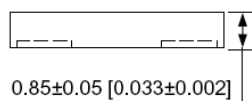
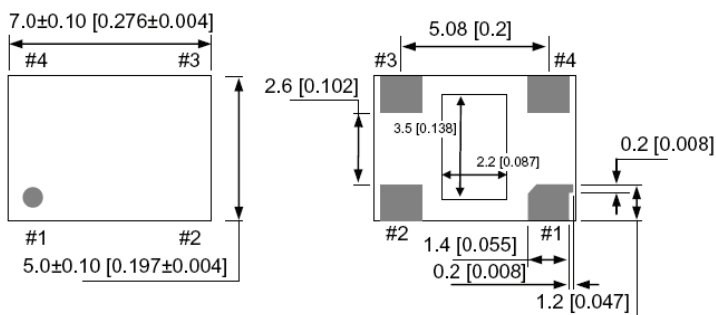
7.0 x 5.0 x 0.85 mm

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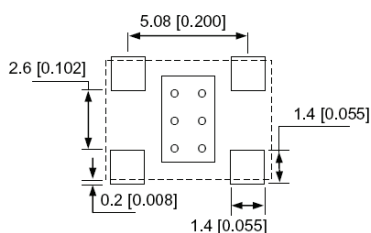
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OUTLINE DIMENSIONS:



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

Recommended Land Pattern



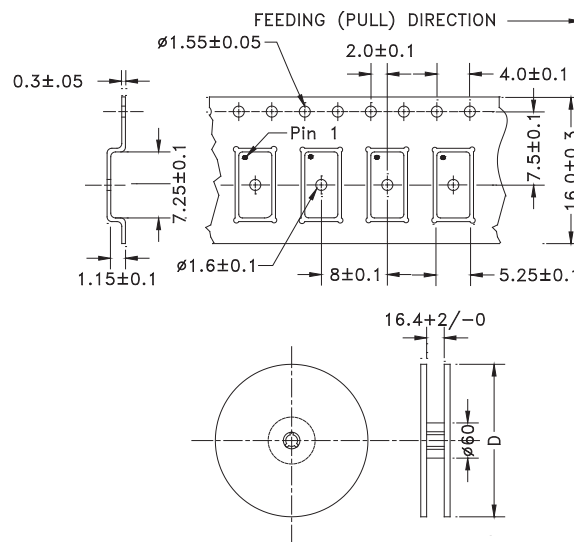
Note: Recommend using an approximately 0.01uF bypass capacitor between PIN 2 and 4.

Dimensions: mm (inches)

TAPE AND REEL:

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

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



Tube: 50 pcs/tube

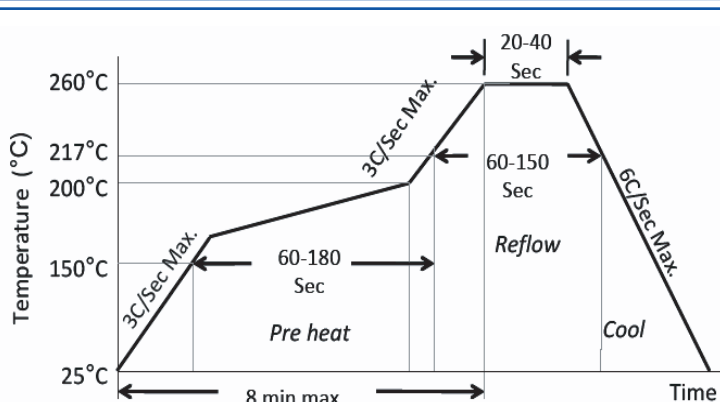


Unit orientation in tube:



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. |

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