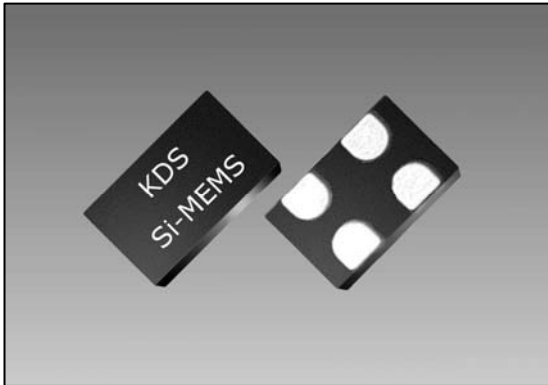


High Temperature MEMS Oscillator

MO8918

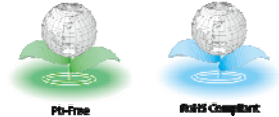


■ Features

- Frequencies between 1 MHz to 110 MHz accurate 6 decimal places
- Industry-Standard packages:
2.0 x 1.6, 2.5 x 2.0, 3.2 x 2.5, 5.0 x 3.2, 7.0 x 5.0 mm
- Excellent total frequency stability as low as $\pm 20 \times 10^{-6}$
- Low power consumption of +3.5 mA typical at $f = 20$ MHz, $V_{dd} = +1.8V$

■ Applications

- Industrial, medical, non AEC-Q100 automotive, avionics and other high temperature applications
- Industrial sensors, PLC, motor servo, outdoor networking equipment, medical video cam, asset tracking systems, etc



■ Standard Specification

| Item | Symbol | Min. | Typ. | Max. | Unit | Condition |
|---------------------------------------|---------------------|-----------------------|------|-----------------------|------------------|--|
| Output Frequency Range | f | 1 | - | 110 | MHz | Refer to datasheet for exact list of supported frequencies |
| Supply Voltage | V _{dd} | +1.62 | +1.8 | +1.98 | V | |
| | | +2.25 | +2.5 | +2.75 | | |
| | | +2.52 | +2.8 | +3.08 | | |
| | | +2.7 | +3.0 | +3.3 | | |
| | | +2.97 | +3.3 | +3.63 | | |
| Operating Temperature Range (ambient) | T _{use} | -40 | - | +105 | °C | Extended Industrial |
| | | -40 | - | +125 | | Automotive |
| Frequency Stability | F _{stab} | -20 | - | +20 | $\times 10^{-6}$ | Inclusive of Initial tolerance at +25°C, 1st year aging at +25°C, and variations over operating temperature, rated power supply voltage and load (15 pF \pm 10%). |
| | | -25 | - | +25 | | |
| | | -30 | - | +30 | | |
| | | -50 | - | +50 | | |
| Current Consumption | I _{dd} | - | +3.8 | +4.7 | mA | No load condition, $f = 20$ MHz, $V_{dd} = +2.8V, +3.0V$ or $+3.3V$ |
| | | - | +3.6 | +4.5 | | No load condition, $f = 20$ MHz, $V_{dd} = +2.5V$ |
| | | - | +3.5 | +4.5 | | No load condition, $f = 20$ MHz, $V_{dd} = +1.8V$ |
| OE Disable Current | I _{od} | - | - | +4.5 | mA | $V_{dd} = +2.5V$ to $+3.3V$, OE = Low, Output in high Z state |
| | | - | - | +4.3 | | $V_{dd} = +1.8V$, OE = Low, Output in high Z state |
| Standby Current | I _{std} | - | +2.6 | +8.5 | μA | $V_{dd} = +2.8V$ to $+3.3V$, $\overline{ST} = Low$, Output is weakly pulled down |
| | | - | +1.4 | +5.5 | | $V_{dd} = +2.5V$, $\overline{ST} = Low$, Output is weakly pulled down |
| | | - | +0.6 | +4.0 | | $V_{dd} = +1.8V$, $\overline{ST} = Low$, Output is weakly pulled down |
| Duty Cycle | DC | 45 | - | 55 | % | All V _{dds} |
| Output Low Voltage | V _{OL} | - | - | V _{dd} x 0.1 | V | I _{OL} = +4.0 mA ($V_{dd} = +3.0V$ or $+3.3V$) I _{OL} = +3.0 mA ($V_{dd} = +2.8V$ or $+2.5V$) I _{OL} = +2.0 mA ($V_{dd} = +1.8V$) |
| Output High Voltage | V _{OH} | V _{dd} x 0.9 | - | - | V | I _{OH} = -4.0 mA ($V_{dd} = +3.0V$ or $+3.3V$) I _{OH} = -3.0 mA ($V_{dd} = +2.8V$ or $+2.5V$) I _{OH} = -2.0 mA ($V_{dd} = +1.8V$) |
| Rise/Fall Time | Tr, Tf | - | 1.0 | 2.0 | ns | $V_{dd} = +2.5V, +2.8V, +3.0V$ or $+3.3V$, 20% - 80% |
| | | - | 1.3 | 2.5 | | $V_{dd} = +1.8V$, 20% - 80% |
| | | - | 1.0 | 3.0 | | $V_{dd} = +2.25V - +3.63V$, 20% - 80% |
| Input Low Voltage | V _{IL} | - | - | V _{dd} x 0.3 | V | Pin 1, OE or \overline{ST} |
| Input High Voltage | V _{IH} | V _{dd} x 0.7 | - | - | V | Pin 1, OE or \overline{ST} |
| Startup Time | T _{start} | - | - | 5.0 | ms | Measured from the time V _{dd} reaches its rated minimum value |
| Enable/Disable Time | T _{oe} | - | - | 130 | ns | $f = 110$ MHz. For other frequencies, T _{oe} = 100 ns + 3 * cycles |
| Resume Time | T _{resume} | - | - | 5.0 | ms | Measured from the time \overline{ST} pin crosses 50% threshold |
| RMS Period Jitter | T _{jitt} | - | 1.6 | 2.5 | ps | $f = 75$ MHz, $V_{dd} = +2.5V, +2.8V, +3.0V$ or $+3.3V$ |
| | | - | 1.9 | 3.0 | | $f = 75$ MHz, $V_{dd} = +1.8V$ |
| Peak-topeak Period Jitter | T _{pk} | - | 12 | 20 | ps | $f = 75$ MHz, $V_{dd} = +2.5V, +2.8V, +3.0V$ or $+3.3V$ |
| | | - | 14 | 25 | | $f = 75$ MHz, $V_{dd} = +1.8V$ |
| RMS Phase Jitter (random) | T _{phj} | - | 0.5 | 0.8 | ps | $f = 75$ MHz, Integration bandwidth = 900 kHz to 7.5 MHz |
| | | - | 1.3 | 2.0 | | $f = 75$ MHz, Integration bandwidth = 12 kHz to 20 MHz |

Consult our sales representative for other specifications.

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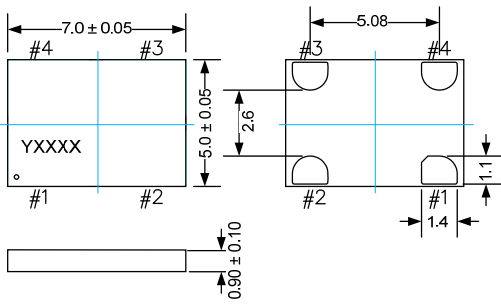
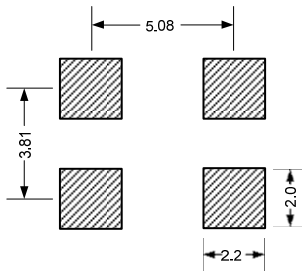
■ Dimensions and Patterns

| Package Size – Dimensions (Unit: mm) ^[1] | Recommended Land Pattern (Unit: mm) ^[2] |
|---|--|
| <p>2.0 x 1.6 x 0.75 mm</p> | |
| <p>2.5 x 2.0 x 0.75 mm</p> | |
| <p>3.2 x 2.5 x 0.75 mm</p> | |
| <p>5.0 x 3.2 x 0.75 mm</p> | |

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■ Dimensions and Patterns

| Package Size – Dimensions (Unit: mm) ^[1] | Recommended Land Pattern (Unit: mm) ^[2] |
|---|---|
| <p>7.0 x 5.0 x 0.90 mm</p>  <p>The drawing shows a top view and a side view of the package. The top view is a rectangle with a width of 7.0 ± 0.05 mm and a height of 5.0 ± 0.05 mm. It features four mounting pads labeled #1, #2, #3, and #4. Pad #1 is at the bottom center with a width of 1.4 mm. Pad #2 is at the bottom corners with a width of 1.1 mm. Pads #3 and #4 are at the top corners with a width of 5.08 mm between them. A central marking 'YXXXX' is located between vertical lines #3 and #4. A side view shows a thickness of 0.90 ± 0.10 mm. A distance of 2.6 mm is shown from the top edge to the center of the pads.</p> |  <p>The land pattern diagram shows four rectangular pads arranged in a 2x2 grid. The horizontal distance between the centers of the top two pads is 5.08 mm. The vertical distance between the centers of the left two pads is 3.81 mm. The width of each pad is 2.2 mm, and the height of each pad is 2.0 mm.</p> |

Notes:

1. Top marking: Y denotes manufacturing origin and XXXX denotes manufacturing lot number. The value of "Y" will depend on the assembly location of the device.
2. A capacitor of value $0.1 \mu\text{F}$ between Vdd and GND is required.