

# EMK12H2J-34.368M

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## REGULATORY COMPLIANCE (Data Sheet downloaded on Dec 24, 2017)


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## ITEM DESCRIPTION

MEMS Clock Oscillators LVCMOS (CMOS) 2.5Vdc 4 Pad 5.0mm x 7.0mm Plastic Surface Mount (SMD) 34.368MHz  $\pm 50$ ppm over  $-40^{\circ}\text{C}$  to  $+85^{\circ}\text{C}$

## ELECTRICAL SPECIFICATIONS

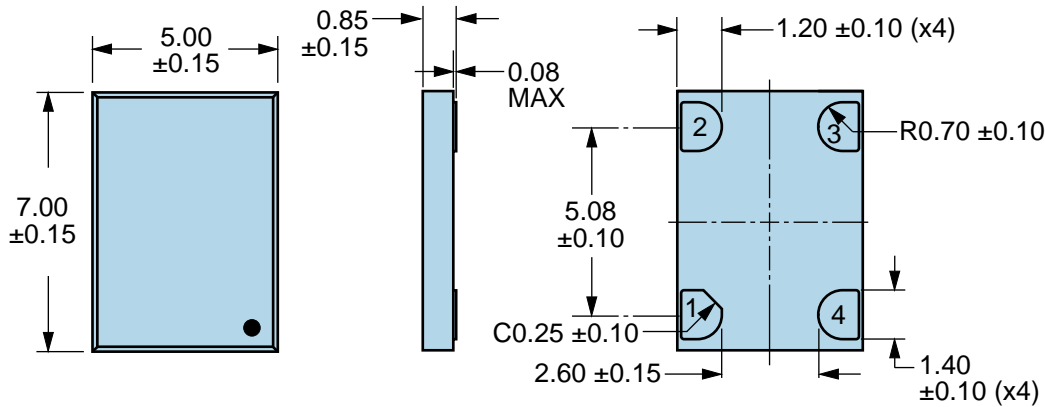
|                                 |  |
|---------------------------------|--|
| Nominal Frequency               | 34.368MHz  |
| Frequency Tolerance/Stability   | $\pm 50$ ppm Maximum over $-40^{\circ}\text{C}$ to $+85^{\circ}\text{C}$ (Inclusive of all conditions: Calibration Tolerance at $25^{\circ}\text{C}$ , Frequency Stability over the Operating Temperature Range, Supply Voltage Change, Output Load Change, First Year Aging at $25^{\circ}\text{C}$ , $260^{\circ}\text{C}$ Reflow, Shock, and Vibration) |
| Aging at $25^{\circ}\text{C}$   | $\pm 1$ ppm Maximum First Year   |
| Supply Voltage                  | 2.5Vdc $\pm 5\%$   |
| Input Current                   | 20mA Maximum   |
| Output Voltage Logic High (Voh) | 90% of Vdd Minimum (IOH= $-8$ mA)  |
| Output Voltage Logic Low (Vol)  | 10% of Vdd Maximum (IOL= $+8$ mA)  |
| Rise/Fall Time                  | 2nSec Maximum (Measured from 20% to 80% of waveform)   |
| Duty Cycle                      | 50 $\pm 5$ (%) (Measured at 50% of waveform)   |
| Load Drive Capability           | 15pF Maximum   |
| Output Logic Type               | CMOS   |
| Output Control Function         | Power Down (Disabled Output: Logic Low)  |
| Output Control Input Voltage    | $+0.7$ Vdd Minimum or No Connect to Enable Output, $+0.3$ Vdd Maximum to Disable Output  |
| Standby Current                 | 50 $\mu$ A Maximum (Disabled Output: Logic Low)  |
| Peak to Peak Jitter (tPK)       | 250pSec Maximum, 100pSec Typical   |
| Start Up Time                   | 50mSec Maximum   |
| Storage Temperature Range       | $-55^{\circ}\text{C}$ to $+125^{\circ}\text{C}$  |

## ENVIRONMENTAL & MECHANICAL SPECIFICATIONS

|                              |  |
|------------------------------|--|
| ESD Susceptibility           | MIL-STD-883, Method 3015, Class 2, HBM 2000V                       |
| Flammability                 | UL94-V0  |
| Mechanical Shock             | MIL-STD-883, Method 2002, Condition G, 30,000G                     |
| Moisture Resistance          | MIL-STD-883, Method 1004   |
| Moisture Sensitivity Level   | J-STD-020, MSL 1   |
| Resistance to Soldering Heat | MIL-STD-202, Method 210, Condition K                               |
| Resistance to Solvents       | MIL-STD-202, Method 215  |
| Solderability                | MIL-STD-883, Method 2003 (Four I/O Pads on bottom of package only) |
| Temperature Cycling          | MIL-STD-883, Method 1010, Condition B                              |
| Thermal Shock                | MIL-STD-883, Method 1011, Condition B                              |
| Vibration                    | MIL-STD-883, Method 2007, Condition A, 20G                         |

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### MECHANICAL DIMENSIONS (all dimensions in millimeters)



| PIN | CONNECTION             |
|-----|------------------------|
| 1   | Power Down (Logic Low) |
| 2   | Ground                 |
| 3   | Output                 |
| 4   | Supply Voltage         |

| LINE | MARKING   |
|------|---|
| 1    | XXXXX<br>XXXXX=Ecliptek<br>Manufacturing Lot Code |

### Suggested Solder Pad Layout

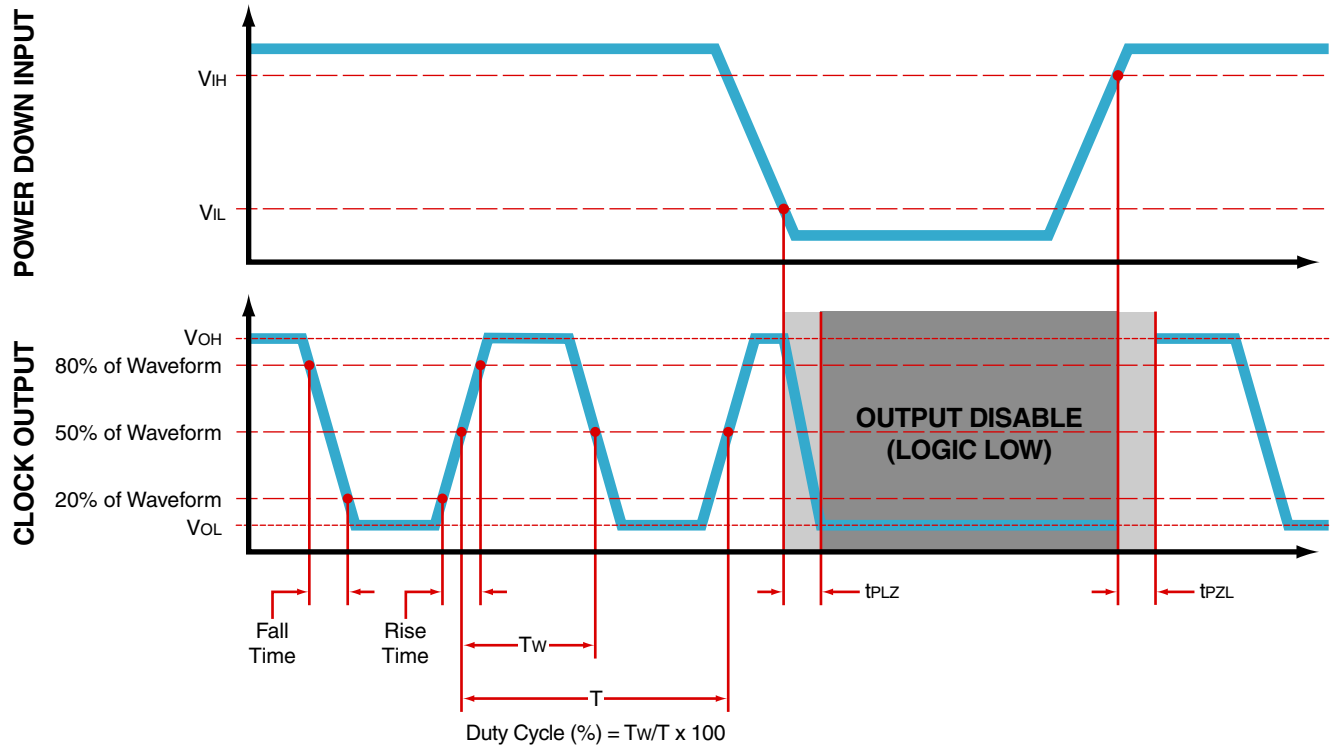
All Dimensions in Millimeters



All Tolerances are  $\pm 0.1$

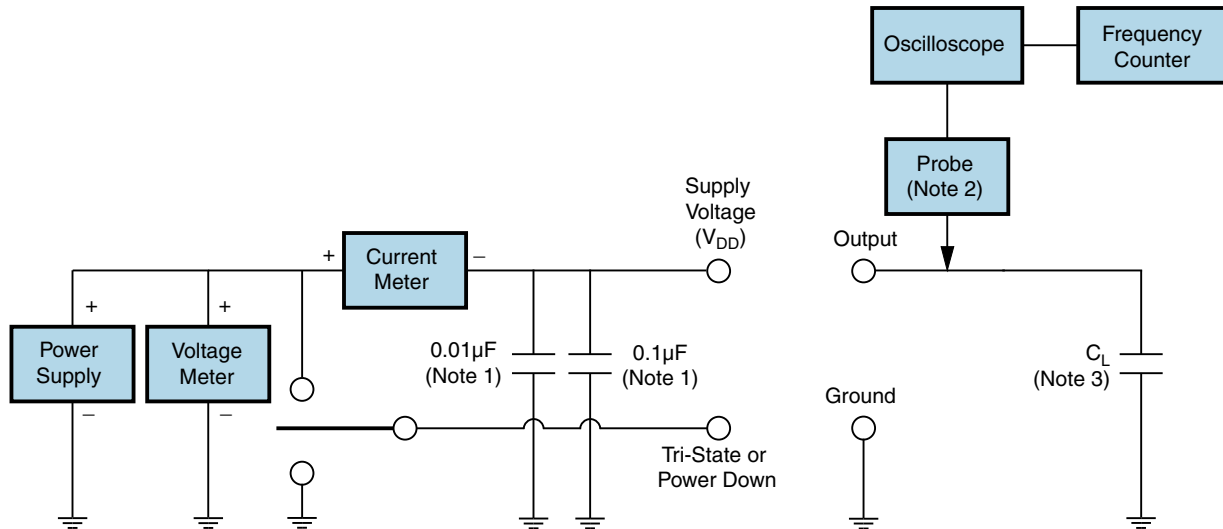
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## OUTPUT WAVEFORM & TIMING DIAGRAM



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## Test Circuit for CMOS Output



Note 1: An external 0.01µF ceramic bypass capacitor in parallel with a 0.1µF high frequency ceramic bypass capacitor close (less than 2mm) to the package ground and supply voltage pin is required.

Note 2: A low input capacitance (<12pF), 10X Attenuation Factor, High Impedance (>10Mohms), and High bandwidth (>300MHz) passive probe is recommended.

Note 3: Capacitance value C<sub>L</sub> includes sum of all probe and fixture capacitance. See applicable specification sheet for 'Load Drive Capability'.

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## Recommended Solder Reflow Methods



### High Temperature Infrared/Convection

|                                    |                    |
|------------------------------------|--------------------|
| <b>Ts MAX to TL (Ramp-up Rate)</b> | 3°C/Second Maximum |
|------------------------------------|--------------------|

#### Preheat

|                                |                  |
|--------------------------------|------------------|
| - Temperature Minimum (Ts MIN) | 150°C            |
| - Temperature Typical (Ts TYP) | 175°C            |
| - Temperature Maximum (Ts MAX) | 200°C            |
| - Time (ts MIN)                | 60 - 180 Seconds |

|                                |                    |
|--------------------------------|--------------------|
| <b>Ramp-up Rate (TL to TP)</b> | 3°C/Second Maximum |
|--------------------------------|--------------------|

#### Time Maintained Above:

|                    |                  |
|--------------------|------------------|
| - Temperature (TL) | 217°C            |
| - Time (tL)        | 60 - 150 Seconds |

|                              |                                      |
|------------------------------|--------------------------------------|
| <b>Peak Temperature (TP)</b> | 260°C Maximum for 10 Seconds Maximum |
|------------------------------|--------------------------------------|

|  |               |
|--|---------------|
| <b>Target Peak Temperature (TP Target)</b> | 250°C +0/-5°C |
|--|---------------|

|  |                 |
|--|-----------------|
| <b>Time within 5°C of actual peak (tp)</b> | 20 - 40 Seconds |
|--|-----------------|

|                       |                    |
|-----------------------|--------------------|
| <b>Ramp-down Rate</b> | 6°C/Second Maximum |
|-----------------------|--------------------|

|  |                   |
|--|-------------------|
| <b>Time 25°C to Peak Temperature (t)</b> | 8 Minutes Maximum |
|--|-------------------|

|                                   |         |
|-----------------------------------|---------|
| <b>Moisture Sensitivity Level</b> | Level 1 |
|-----------------------------------|---------|

