

# EV34C6A4A1-19.440M TR



## ITEM DESCRIPTION

Voltage Controlled Quartz Crystal Clock Oscillators VCXO LVCMOS (CMOS) 2.5Vdc 6 Pad 5.0mm x 7.0mm Ceramic Surface Mount (SMD) 19.440MHz  $\pm 50$ ppm Maximum 0°C to +70°C  $\pm 80$ ppm Minimum 10% Typical, 20% Maximum

## ELECTRICAL SPECIFICATIONS

|                                       |                                                                                                                                                                                                                                                    |
|---------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Nominal Frequency                     | 19.440MHz                                                                                                                                                                                                                                          |
| Frequency Tolerance/Stability         | $\pm 50$ ppm Maximum (Inclusive of all conditions: Calibration Tolerance at 25°C, Frequency Stability over the Operating Temperature Range, Supply Voltage Change, Output Load Change, Shock, and Vibration.)                                      |
| Aging at 25°C                         | $\pm 2$ ppm/First Year Typical, $\pm 10$ ppm/10 Years Maximum                                                                                                                                                                                      |
| Operating Temperature Range           | 0°C to +70°C                                                                                                                                                                                                                                       |
| Supply Voltage                        | 2.5Vdc $\pm 5\%$                                                                                                                                                                                                                                   |
| Input Current                         | 15mA Maximum                                                                                                                                                                                                                                       |
| Output Voltage Logic High (Voh)       | 90% of Vdd Minimum (IOH = -4mA)                                                                                                                                                                                                                    |
| Output Voltage Logic Low (Vol)        | 10% of Vdd Maximum (IOL = +4mA)                                                                                                                                                                                                                    |
| Rise/Fall Time                        | 5nSec Maximum (Measured at 20% to 80% of Waveform)                                                                                                                                                                                                 |
| Duty Cycle                            | 50 $\pm 10$ (%) (Measured at 50% of Waveform)                                                                                                                                                                                                      |
| Load Drive Capability                 | 15pF Maximum                                                                                                                                                                                                                                       |
| Output Logic Type                     | CMOS                                                                                                                                                                                                                                               |
| Absolute Pull Range                   | $\pm 80$ ppm Minimum (Inclusive of all conditions: Calibration Tolerance at 25°C, Frequency Stability over the Operating Temperature Range, Supply Voltage Change, Output Load Change, Shock, Vibration, and Aging over the Control Voltage (Vc).) |
| Control Voltage                       | 0.2Vdc to 2.3Vdc (Test Condition for APR)                                                                                                                                                                                                          |
| Control Voltage Range                 | 0.0Vdc to Vdd                                                                                                                                                                                                                                      |
| Linearity                             | 10% Typical, 20% Maximum                                                                                                                                                                                                                           |
| Transfer Function                     | Positive Transfer Characteristic                                                                                                                                                                                                                   |
| Modulation Bandwidth                  | 10kHz Minimum (Measured at -3dB, Vc = 1.25Vdc)                                                                                                                                                                                                     |
| Input Impedance                       | 50kOhms Minimum                                                                                                                                                                                                                                    |
| Input Leakage Current                 | 10 $\mu$ A Maximum                                                                                                                                                                                                                                 |
| Phase Noise                           | All Values are Typical<br>-65dBc/Hz at offset of 10Hz<br>-95dBc/Hz at offset of 100Hz<br>-120dBc/Hz at offset of 1kHz<br>-142dBc/Hz at offset of 10kHz<br>-152dBc/Hz at offset of 100kHz<br>-154dBc/Hz at offset of 1MHz                           |
| Tri-State Input Voltage (Vih and Vil) | 90% of Vdd Minimum or No Connect to Enable Output, 10% of Vdd Maximum to Disable Output (High Impedance)                                                                                                                                           |
| RMS Phase Jitter                      | 1pSec Maximum (Fj = 12kHz to 20MHz; Random)                                                                                                                                                                                                        |
| Start Up Time                         | 10mSec Maximum                                                                                                                                                                                                                                     |
| Storage Temperature Range             | -55°C to +125°C                                                                                                                                                                                                                                    |

## ENVIRONMENTAL & MECHANICAL SPECIFICATIONS

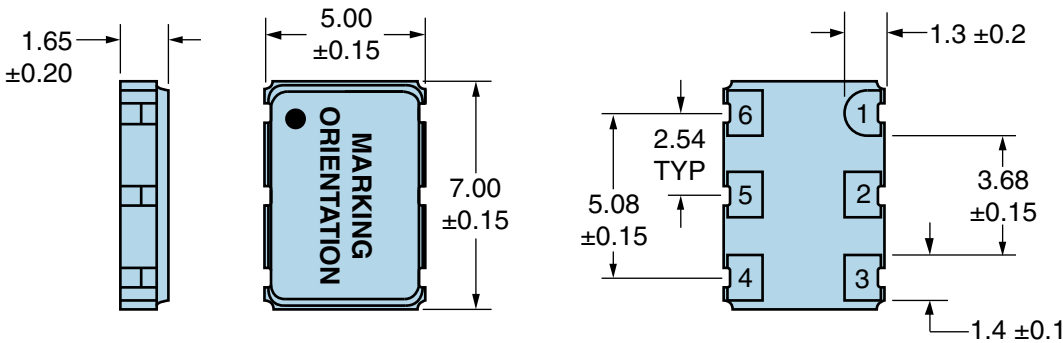
|                     |                                               |
|---------------------|-----------------------------------------------|
| ESD Susceptibility  | MIL-STD-883, Method 3015, Class 1, HBM: 1500V |
| Fine Leak Test      | MIL-STD-883, Method 1014, Condition A         |
| Flammability        | UL94-V0                                       |
| Gross Leak Test     | MIL-STD-883, Method 1014, Condition C         |
| Mechanical Shock    | MIL-STD-883, Method 2002, Condition B         |
| Moisture Resistance | MIL-STD-883, Method 1004                      |

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| ENVIRONMENTAL & MECHANICAL SPECIFICATIONS CONTINUED |                                       |
|-----------------------------------------------------|---------------------------------------|
| Moisture Sensitivity                                | 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              |
| Temperature Cycling                                 | MIL-STD-883, Method 1010, Condition B |
| Vibration                                           | MIL-STD-883, Method 2007, Condition A |

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MECHANICAL DIMENSIONS (all dimensions in millimeters)

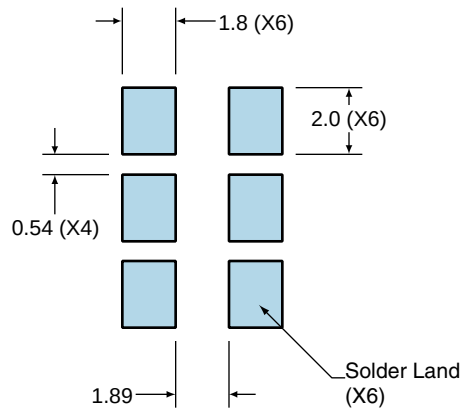


| PIN | CONNECTION      |
|-----|-----------------|
| 1   | Control Voltage |
| 2   | Tri-State       |
| 3   | Case/Ground     |
| 4   | Output          |
| 5   | No Connect      |
| 6   | Supply Voltage  |

| LINE | MARKING                                               |
|------|-------------------------------------------------------|
| 1    | ECLIPTEK                                              |
| 2    | 19.440M                                               |
| 3    | XXXXXX<br>XXXXXX=Ecliptek<br>Manufacturing Identifier |

Suggested Solder Pad Layout

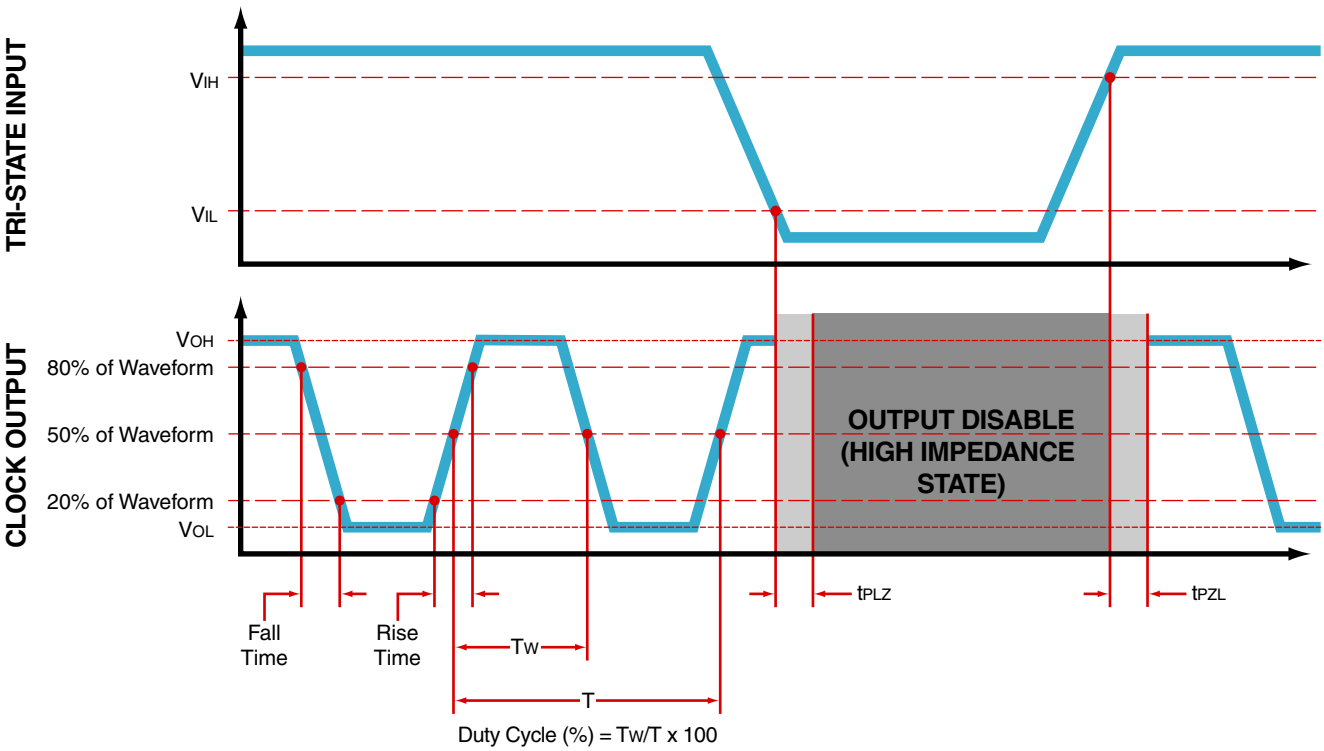
All Dimensions in Millimeters



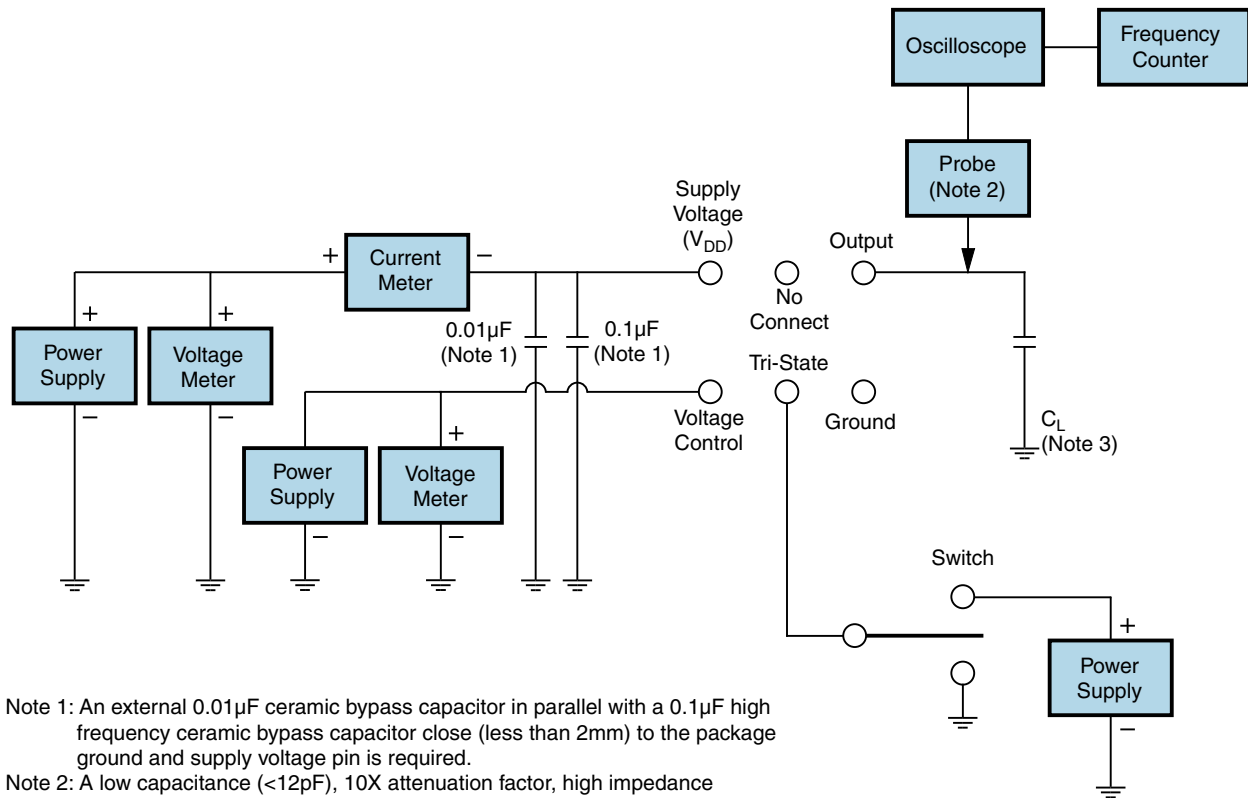
All Tolerances are ±0.1

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OUTPUT WAVEFORM & TIMING DIAGRAM



## Test Circuit for CMOS Output



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

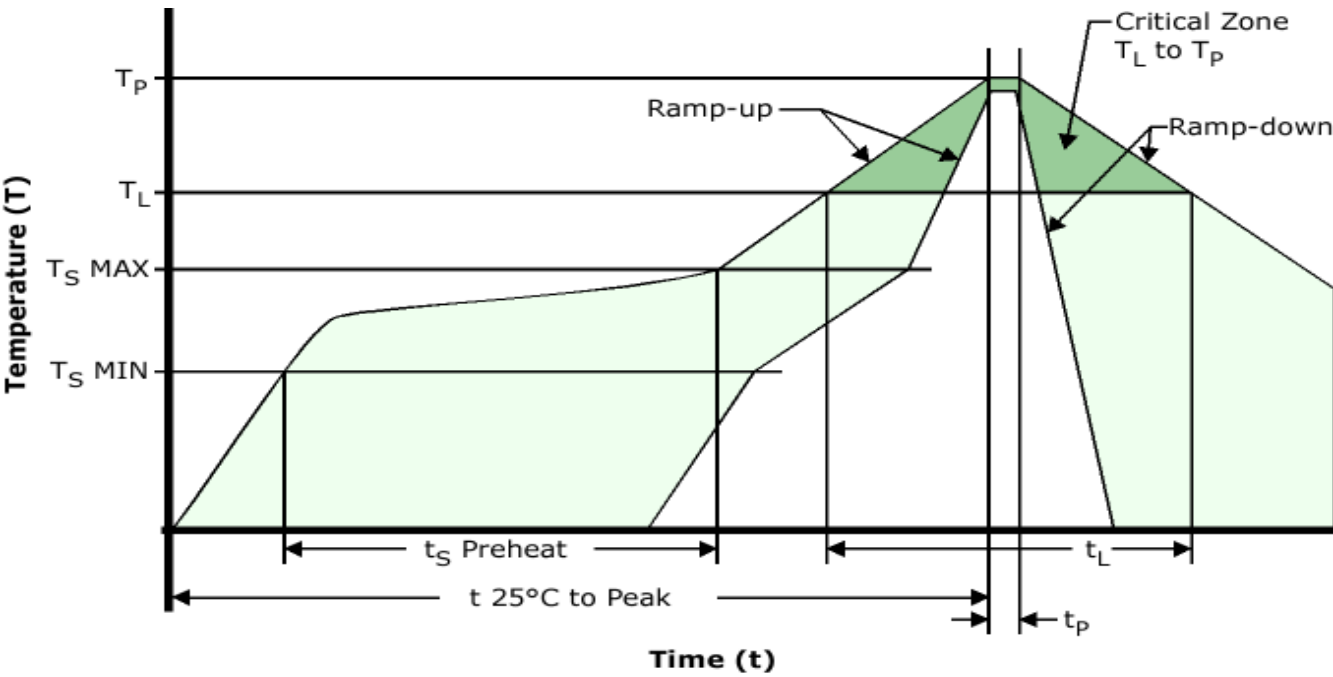
Note 2: A low capacitance (<12pF), 10X attenuation factor, high impedance (>10Mohms), and high bandwidth (>300MHz) passive probe is recommended.

Note 3: Capacitance value  $C_L$  includes sum of all probe and fixture capacitance.



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Recommended Solder Reflow Methods

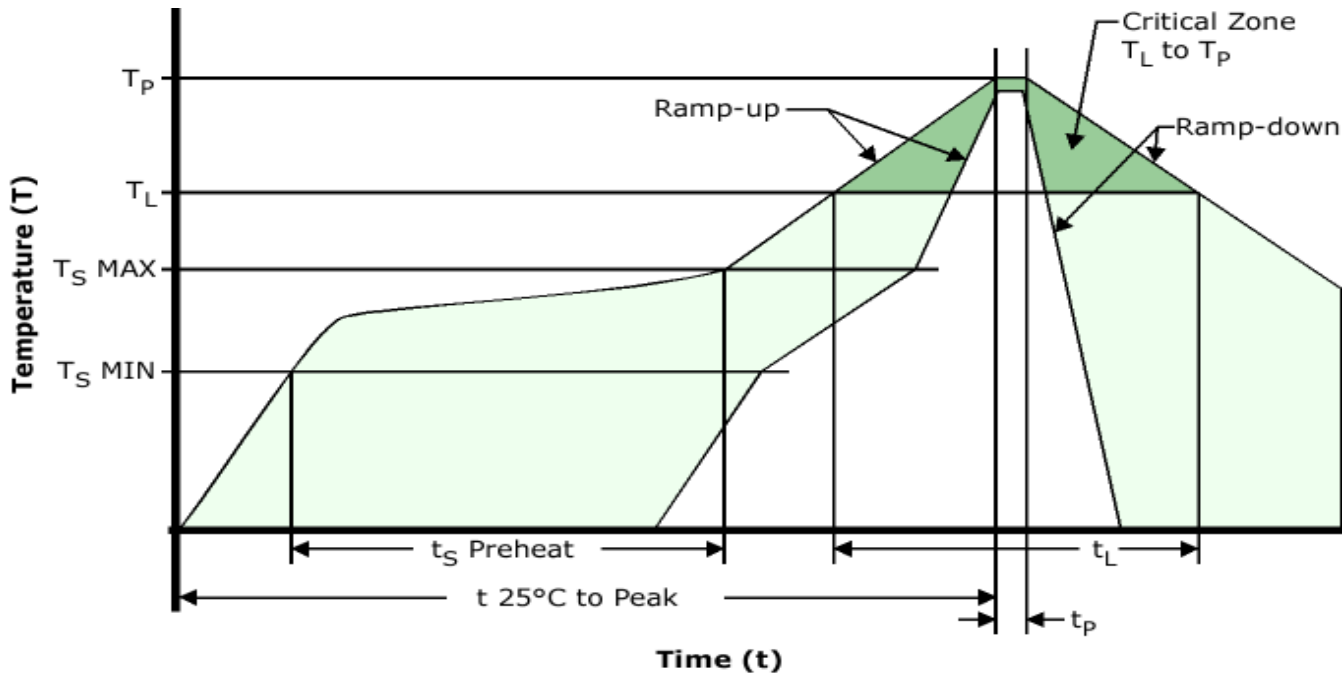


High Temperature Infrared/Convection

|                                                     |                                      |
|-----------------------------------------------------|--------------------------------------|
| T <sub>S</sub> MAX to T <sub>L</sub> (Ramp-up Rate) | 3°C/Second Maximum                   |
| Preheat                                             |                                      |
| - Temperature Minimum (T <sub>S</sub> MIN)          | 150°C                                |
| - Temperature Typical (T <sub>S</sub> TYP)          | 175°C                                |
| - Temperature Maximum (T <sub>S</sub> MAX)          | 200°C                                |
| - Time (t <sub>S</sub> MIN)                         | 60 - 180 Seconds                     |
| Ramp-up Rate (T <sub>L</sub> to T <sub>P</sub> )    | 3°C/Second Maximum                   |
| Time Maintained Above:                              |                                      |
| - Temperature (T <sub>L</sub> )                     | 217°C                                |
| - Time (t <sub>L</sub> )                            | 60 - 150 Seconds                     |
| Peak Temperature (T <sub>P</sub> )                  | 260°C Maximum for 10 Seconds Maximum |
| Target Peak Temperature (T <sub>P</sub> Target)     | 250°C +0/-5°C                        |
| Time within 5°C of actual peak (t <sub>p</sub> )    | 20 - 40 Seconds                      |
| Ramp-down Rate                                      | 6°C/Second Maximum                   |
| Time 25°C to Peak Temperature (t)                   | 8 Minutes Maximum                    |
| Moisture Sensitivity Level                          | Level 1                              |

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## Recommended Solder Reflow Methods



## Low Temperature Infrared/Convection 240°C

Ts MAX to Tl (Ramp-up Rate) 5°C/Second Maximum

### Preheat

- Temperature Minimum (Ts MIN) N/A
- Temperature Typical (Ts TYP) 150°C
- Temperature Maximum (Ts MAX) N/A
- Time (ts MIN) 60 - 120 Seconds

Ramp-up Rate (Tl to Tp) 5°C/Second Maximum

### Time Maintained Above:

- Temperature (Tl) 150°C
- Time (tL) 200 Seconds Maximum

Peak Temperature (Tp) 240°C Maximum

Target Peak Temperature (Tp Target) 240°C Maximum 2 Times / 230°C Maximum 1 Time

Time within 5°C of actual peak (tp) 10 Seconds Maximum 2 Times / 80 Seconds Maximum 1 Time

Ramp-down Rate 5°C/Second Maximum

Time 25°C to Peak Temperature (t) N/A

Moisture Sensitivity Level Level 1

## Low Temperature Manual Soldering

185°C Maximum for 10 Seconds Maximum, 2 times Maximum.

## High Temperature Manual Soldering

260°C Maximum for 5 Seconds Maximum, 2 times Maximum.