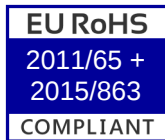


# EV34C8A5A1-13.000M

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## REGULATORY COMPLIANCE (Data Sheet downloaded on Dec 1, 2017)


[Click badges to download compliance docs](#)

Regulatory Compliance standards are subject to updates by governing bodies. Click the badges to download the latest compliance docs for this part number directly from Ecliptek.



## ITEM DESCRIPTION

Voltage Controlled Quartz Crystal Clock Oscillators VCXO LVCMOS (CMOS) 2.5Vdc 6 Pad 3.2mm x 5.0mm Ceramic Surface Mount (SMD) 13.000MHz  $\pm 50$ ppm Maximum 0°C to +70°C  $\pm 100$ ppm Minimum 10% Typical, 20% Maximum

## ELECTRICAL SPECIFICATIONS

|                                       |                                                                                                                                                                                                                                                     |
|---------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Nominal Frequency                     | 13.000MHz                                                                                                                                                                                                                                           |
| 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                   | $\pm 100$ 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         |

**EV34C8A5A1-13.000M** [Click part number to visit Part Number Details page](#)**ENVIRONMENTAL & MECHANICAL SPECIFICATIONS CONTINUED**

|                                     |                                       |
|-------------------------------------|---------------------------------------|
| <b>Moisture Resistance</b>          | MIL-STD-883, Method 1004              |
| <b>Moisture Sensitivity</b>         | J-STD-020, MSL 1                      |
| <b>Resistance to Soldering Heat</b> | MIL-STD-202, Method 210, Condition K  |
| <b>Resistance to Solvents</b>       | MIL-STD-202, Method 215               |
| <b>Solderability</b>                | MIL-STD-883, Method 2003              |
| <b>Temperature Cycling</b>          | MIL-STD-883, Method 1010, Condition B |
| <b>Vibration</b>                    | 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    | <b>E13.000</b><br><i>E=Ecliptek Designator</i>                 |
| 2    | <b>XXXXX</b><br><i>XXXXX=Ecliptek Manufacturing Identifier</i> |

Suggested Solder Pad Layout

All Dimensions in Millimeters



All Tolerances are ±0.1

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OUTPUT WAVEFORM & TIMING DIAGRAM





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Recommended Solder Reflow Methods



High Temperature Infrared/Convection

|                                                                        |                                      |
|------------------------------------------------------------------------|--------------------------------------|
| <b><math>T_S \text{ MAX}</math> to <math>T_L</math> (Ramp-up Rate)</b> | 3°C/Second Maximum                   |
| <b>Preheat</b>                                                         |                                      |
| - Temperature Minimum ( $T_S \text{ MIN}$ )                            | 150°C                                |
| - Temperature Typical ( $T_S \text{ TYP}$ )                            | 175°C                                |
| - Temperature Maximum ( $T_S \text{ MAX}$ )                            | 200°C                                |
| - Time ( $t_s \text{ MIN}$ )                                           | 60 - 180 Seconds                     |
| <b>Ramp-up Rate (<math>T_L</math> to <math>T_P</math>)</b>             | 3°C/Second Maximum                   |
| <b>Time Maintained Above:</b>                                          |                                      |
| - Temperature ( $T_L$ )                                                | 217°C                                |
| - Time ( $t_L$ )                                                       | 60 - 150 Seconds                     |
| <b>Peak Temperature (<math>T_P</math>)</b>                             | 260°C Maximum for 10 Seconds Maximum |
| <b>Target Peak Temperature (<math>T_P \text{ Target}</math>)</b>       | 250°C +0/-5°C                        |
| <b>Time within 5°C of actual peak (<math>t_P</math>)</b>               | 20 - 40 Seconds                      |
| <b>Ramp-down Rate</b>                                                  | 6°C/Second Maximum                   |
| <b>Time 25°C to Peak Temperature (<math>t</math>)</b>                  | 8 Minutes Maximum                    |
| <b>Moisture Sensitivity Level</b>                                      | 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.