

# EB71F51C10AV2-10.000M

[Click part number to visit Part Number Details page](#)

## REGULATORY COMPLIANCE (Data Sheet downloaded on Nov 30, 2017)



## ITEM DESCRIPTION

Oven Controlled Quartz Crystal Clock Oscillators OCXO HCMOS (CMOS) 5.0Vdc AT-Cut 14-Pin DIP Metal Thru-Hole 10.000MHz  $\pm 1.0\text{ppm}$  Maximum  $\pm 100\text{ppb}$  Maximum  $0^{\circ}\text{C}$  to  $+50^{\circ}\text{C}$

## ELECTRICAL SPECIFICATIONS

|                                          |                                                                                                                                           |
|------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------|
| Nominal Frequency                        | 10.000MHz                                                                                                                                 |
| Initial Tolerance                        | $\pm 1.0\text{ppm}$ Maximum (Measured at nominal Vdd and Vc; at $25^{\circ}\text{C}$ )                                                    |
| Frequency Stability                      | $\pm 100\text{ppb}$ Maximum (Measured at nominal Vdd and Vc)                                                                              |
| Frequency Stability vs. Input Voltage    | $\pm 50\text{ppb}$ Maximum (Vdd $\pm 5\%$ )                                                                                               |
| Frequency Stability vs. Load             | $\pm 50\text{ppb}$ Maximum (Vload $\pm 5\%$ )                                                                                             |
| Frequency Stability vs. Aging (1 Day)    | $\pm 30\text{ppb}$ Maximum (after 72 hours of operation)                                                                                  |
| Frequency Stability vs. Aging (1 Year)   | $\pm 500\text{ppb}$ Maximum (after 72 hours of operation)                                                                                 |
| Frequency Stability vs. Aging (10 Years) | $\pm 3.0\text{ppm}$ Maximum (after 72 hours of operation)                                                                                 |
| Operating Temperature Range              | $0^{\circ}\text{C}$ to $+50^{\circ}\text{C}$                                                                                              |
| Supply Voltage                           | 5.0Vdc $\pm 5\%$                                                                                                                          |
| Warm Up Time                             | 3 Minutes Maximum (Referenced to $\pm 500\text{ppb}$ of final frequency at 1 hour at $25^{\circ}\text{C}$ )                               |
| Power Consumption                        | 1.6 Watts Maximum at Steady State<br>2.5 Watts Maximum during Warm Up (Measured at $25^{\circ}\text{C}$ )                                 |
| Output Voltage Logic High (Voh)          | Vdd-0.5Vdc Minimum (IOH = -8mA)                                                                                                           |
| Output Voltage Logic Low (Vol)           | 0.5Vdc Maximum (IOL = +8mA)                                                                                                               |
| Rise/Fall Time                           | 6nSec Maximum (Measured at 20% to 80% of waveform)                                                                                        |
| Duty Cycle                               | 50 $\pm 5\%$ (Measured at 50% of waveform)                                                                                                |
| Load Drive Capability                    | 15pF Maximum                                                                                                                              |
| Output Logic Type                        | CMOS                                                                                                                                      |
| Control Voltage                          | 2.5Vdc $\pm 2.5\text{Vdc}$                                                                                                                |
| Control Voltage Range                    | 0.0Vdc to Vdd                                                                                                                             |
| Frequency Deviation                      | $\pm 5\text{ppm}$ Minimum (Referenced to Fo at Vc=2.5Vdc; Vdd=5.0Vdc; over Operating Temperature Range)                                   |
| Linearity                                | $\pm 10\%$ Maximum                                                                                                                        |
| Transfer Function                        | Positive Transfer Characteristic                                                                                                          |
| Input Impedance                          | 10kOhms Typical                                                                                                                           |
| Phase Noise                              | -95dBc/Hz at 10Hz Offset<br>-120dBc/Hz at 100Hz Offset<br>-135dBc/Hz at 1kHz Offset<br>-140dBc/Hz at 10kHz Offset (Measures at 12.800MHz) |
| Start Up Time                            | 10mSec Maximum                                                                                                                            |
| Storage Temperature Range                | $-55^{\circ}\text{C}$ to $+125^{\circ}\text{C}$                                                                                           |

## ENVIRONMENTAL & MECHANICAL SPECIFICATIONS

|                              |                                      |
|------------------------------|--------------------------------------|
| Gross Leak Test              | MIL-STD-883, Method 1014 Condition C |
| Lead Integrity               | MIL-STD-883, Method 2004             |
| Mechanical Shock             | MIL-STD-202, Method 213 Condition C  |
| Resistance to Soldering Heat | MIL-STD-202, Method 210              |
| Resistance to Solvents       | MIL-STD-202, Method 215              |
| Solderability                | MIL-STD-883, Method 2003             |



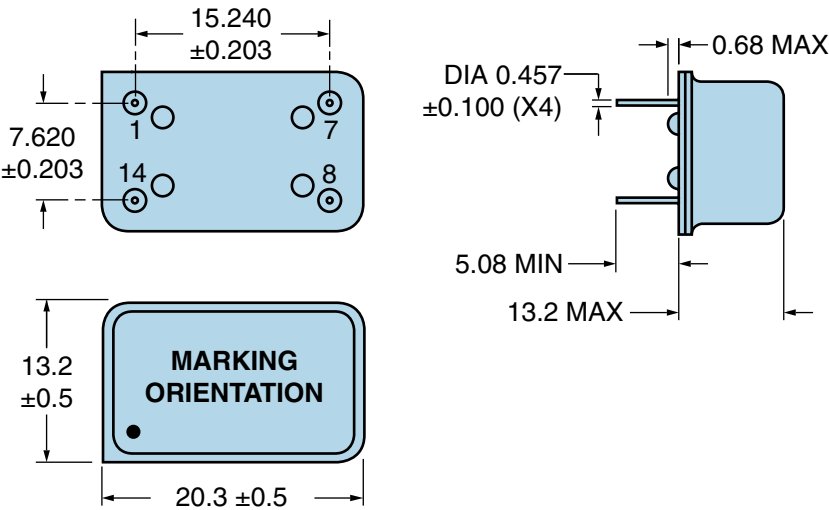
**EB71F51C10AV2-10.000M** [Click part number to visit Part Number Details page](#)

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

EB71F51C10AV2-10.000M

[Click part number to visit Part Number Details page](#)

MECHANICAL DIMENSIONS (all dimensions in millimeters)



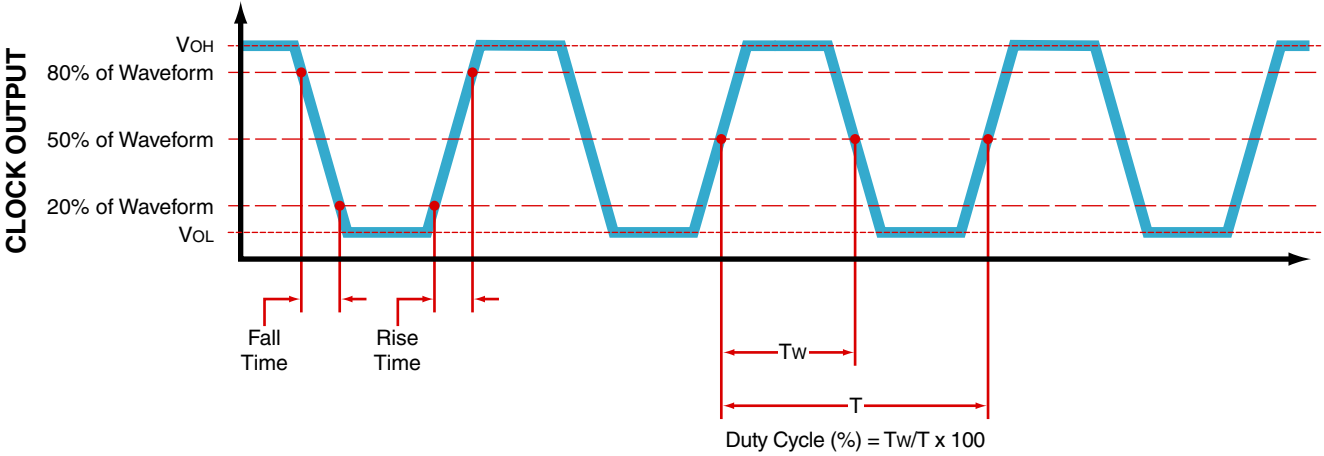
| PIN | CONNECTION      |
|-----|-----------------|
| 1   | Voltage Control |
| 7   | Case Ground     |
| 8   | Output          |
| 14  | Supply Voltage  |

| LINE | MARKING                                               |
|------|-------------------------------------------------------|
| 1    | ECLIPTEK                                              |
| 2    | 10.000M                                               |
| 3    | XXXXXX<br>XXXXXX=Ecliptek<br>Manufacturing Identifier |

EB71F51C10AV2-10.000M

[Click part number to visit Part Number Details page](#)

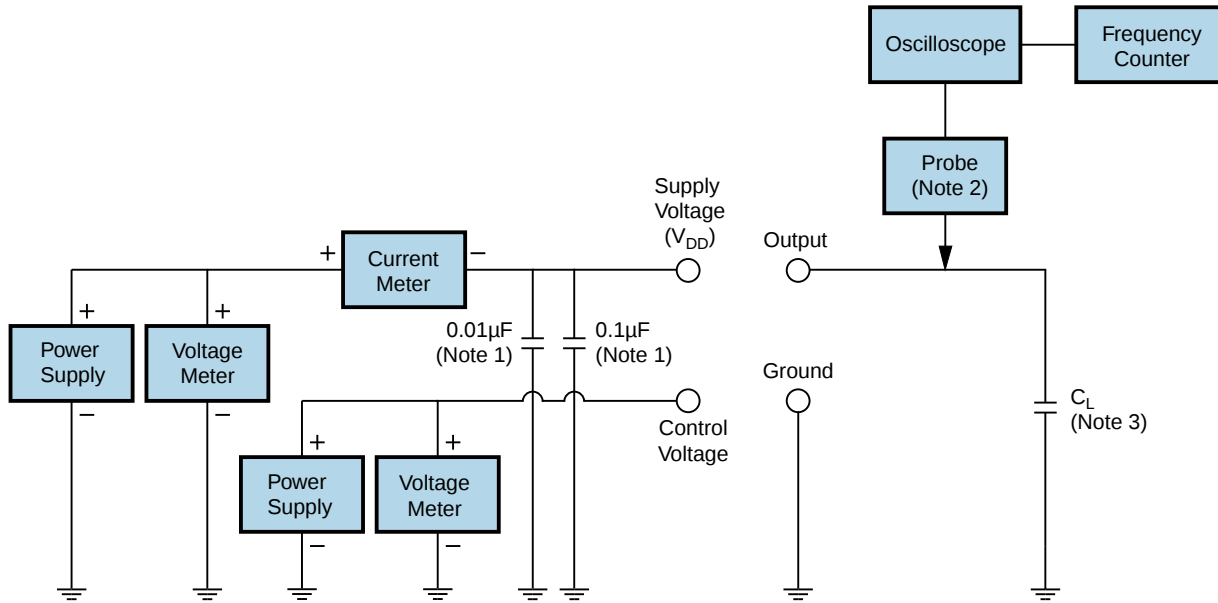
OUTPUT WAVEFORM



# EB71F51C10AV2-10.000M

[Click part number to visit Part Number Details page](#)

## Test Circuit for Voltage Control Option



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

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

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

EB71F51C10AV2-10.000M

[Click part number to visit Part Number Details page](#)

Recommended Solder Reflow Methods



Low Temperature Infrared/Convection 185°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)               | 185°C Maximum                                                                                                 |
| Target Peak Temperature (TP Target) | 185°C Maximum 2 Times                                                                                         |
| Time within 5°C of actual peak (tp) | 10 Seconds Maximum 2 Times                                                                                    |
| Ramp-down Rate                      | 5°C/Second Maximum                                                                                            |
| Time 25°C to Peak Temperature (t)   | N/A                                                                                                           |
| Moisture Sensitivity Level          | Level 1                                                                                                       |
| Additional Notes                    | Temperatures shown are applied to body of device. Use this method only for product with the Gull Wing option. |

EB71F51C10AV2-10.000M

[Click part number to visit Part Number Details page](#)

Recommended Solder Reflow Methods



Low Temperature Solder Bath (Wave Solder)

|                                     |                                                                                                                                          |
|-------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------|
| 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)                     | 30 - 60 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)               | 245°C Maximum                                                                                                                            |
| Target Peak Temperature (TP Target) | 245°C Maximum 1 Time / 235°C Maximum 2 Times                                                                                             |
| Time within 5°C of actual peak (tP) | 5 Seconds Maximum 1 Time / 15 Seconds Maximum 2 Times                                                                                    |
| Ramp-down Rate                      | 5°C/Second Maximum                                                                                                                       |
| Time 25°C to Peak Temperature (t)   | N/A                                                                                                                                      |
| Moisture Sensitivity Level          | Level 1                                                                                                                                  |
| Additional Notes                    | Temperatures shown are applied to back of PCB board and device leads only. Do not use this method for product with the Gull Wing option. |

Low Temperature Manual Soldering

185°C Maximum for 10 Seconds Maximum, 2 times Maximum. (Temperatures listed are applied to device leads only. This method can be utilized with both Gull Wing and Non-Gull Wing devices.)

High Temperature Manual Soldering

260°C Maximum for 5 Seconds Maximum, 2 times Maximum. (Temperatures listed are applied to device leads only. This method can be utilized with both Gull Wing and Non-Gull Wing devices.)