

**EB51F4D15CN-15.728M-CE** [Click part number to visit Part Number Details page](#)
**REGULATORY COMPLIANCE** (Data Sheet downloaded on Dec 4, 2018)

**ITEM DESCRIPTION**

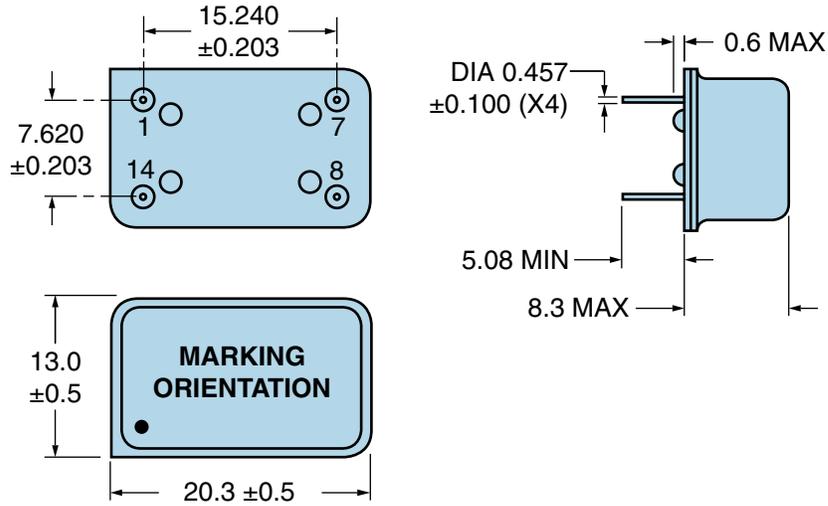
Temperature Compensated Quartz Crystal Clock Oscillators TCXO HCMOS (CMOS) 5.0Vdc 14-Pin DIP Metal Thru-Hole 15.728MHz  $\pm 2.5\text{ppm}$  Maximum  $\pm 1.5\text{ppm}$  Maximum  $-20^{\circ}\text{C}$  to  $+70^{\circ}\text{C}$

**ELECTRICAL SPECIFICATIONS**

Nominal Frequency	15.728MHz
Initial Tolerance	$\pm 2.5\text{ppm}$ Maximum (Measured at Nominal Vdd and Vc)
Frequency Stability	$\pm 1.5\text{ppm}$ Maximum
Frequency Stability vs. Input Voltage	$\pm 0.3\text{ppm}$ Maximum (Vdd $\pm 5\%$ )
Frequency Stability vs. Load	$\pm 0.2\text{ppm}$ Maximum ( $\pm 10\%$ )
Frequency Stability vs. Aging	$\pm 1\text{ppm/Year}$ Maximum (at $25^{\circ}\text{C}$ )
Operating Temperature Range	$-20^{\circ}\text{C}$ to $+70^{\circ}\text{C}$
Supply Voltage	5.0Vdc $\pm 5\%$
Input Current	30mA Maximum (Measured at Steady State at $25^{\circ}\text{C}$ ; at Nominal Vdd and Nominal Vc)
Output Voltage Logic High (Voh)	Vdd-0.5Vdc Minimum
Output Voltage Logic Low (Vol)	0.5Vdc Maximum
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	30pF HCMOS Load Maximum
Output Logic Type	CMOS
Control Voltage	None (No Connect on Pin 1)
Input Impedance	10kOhms Typical
Phase Noise	-70dBc/Hz at 10Hz Offset, -100dBc/Hz at 100Hz Offset, -130dBc/Hz at 1kHz Offset, -140dBc/Hz at 10kHz Offset, -145dBc/Hz at 100kHz Offset (Typical Values at 19.440MHz)
Storage Temperature Range	$-55^{\circ}\text{C}$ to $+125^{\circ}\text{C}$

**ENVIRONMENTAL & MECHANICAL SPECIFICATIONS**

Fine Leak Test	MIL-STD-883, Method 1014 Condition A
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
Temperature Cycling	MIL-STD-883, Method 1010
Vibration	MIL-STD-883, Method 2007 Condition A

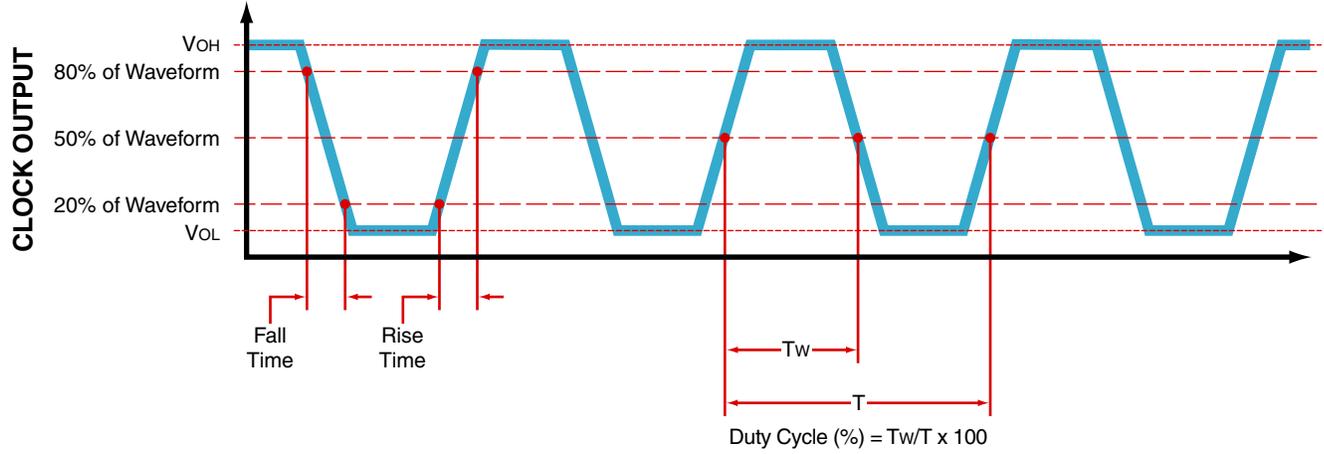
**EB51F4D15CN-15.728M-CE** [Click part number to visit Part Number Details page](#)
**MECHANICAL DIMENSIONS (all dimensions in millimeters)**


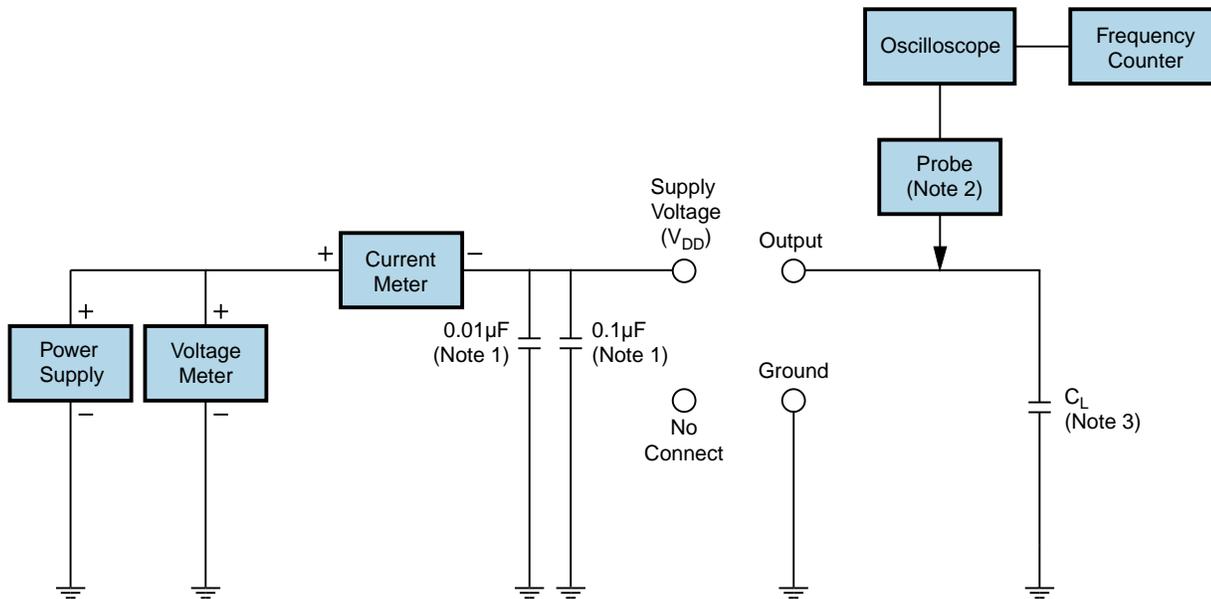
PIN	CONNECTION
1	No Connect
7	Case Ground
8	Output
14	Supply Voltage

LINE	MARKING
1	<b>ECLIPTEK</b>
2	<b>15.728M</b>
3	<b>XXYYZ</b> XX=Ecliptek Manufacturing Code Y=Last Digit of the Year ZZ=Week of the Year

# EB51F4D15CN-15.728M-CE [Click part number to visit Part Number Details page](#)

## OUTPUT WAVEFORM

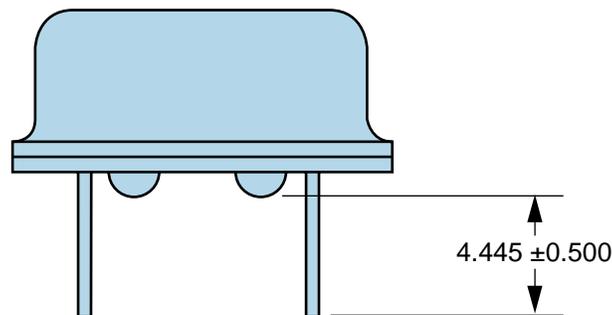


**EB51F4D15CN-15.728M-CE** [Click part number to visit Part Number Details page](#)
**Test Circuit for No Connect Option**


Note 1: An external 0.1µF low frequency tantalum bypass capacitor in parallel with a 0.01µF high frequency ceramic bypass capacitor close to the package ground and  $V_{DD}$  pin is required.

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

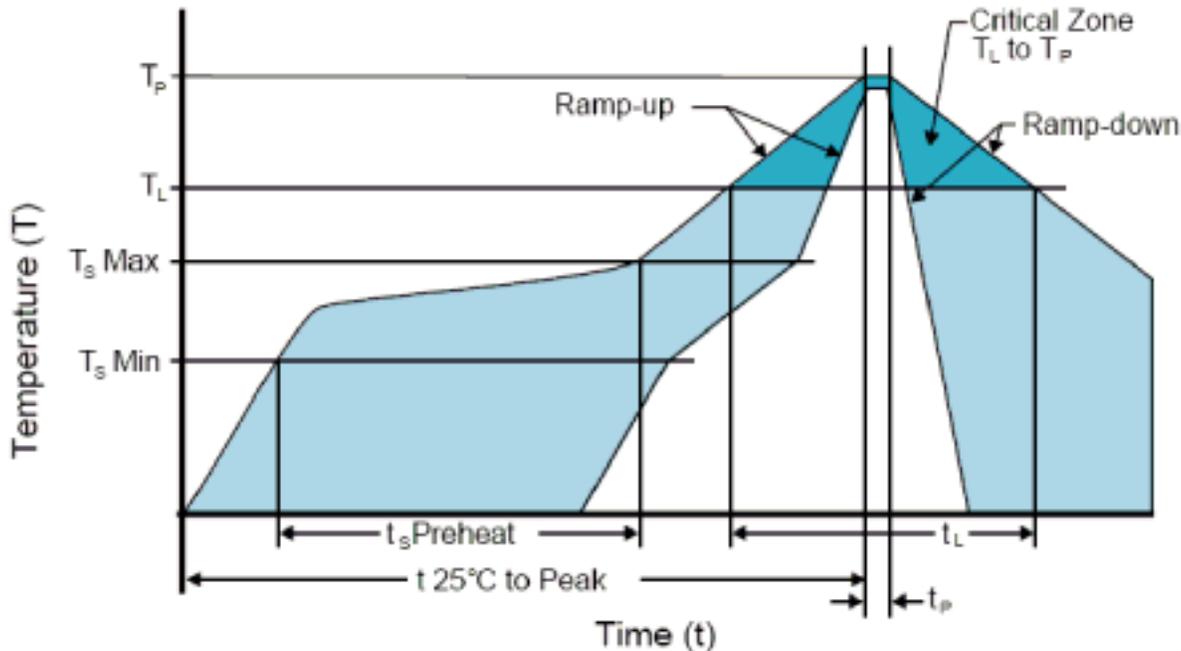
Note 3: Capacitance value  $C_L$  includes sum of all probe and fixture capacitance.

**Value Added Option - Cut Leads**


All dimensions are in millimeters

# EB51F4D15CN-15.728M-CE [Click part number to visit Part Number Details page](#)

## Recommended Solder Reflow Methods



### Low Temperature Solder Bath (Wave Solder)

$T_s$ MAX to $T_L$ (Ramp-up Rate)	5°C/Second Maximum
<b>Preheat</b>	
- Temperature Minimum ( $T_s$ MIN)	N/A
- Temperature Typical ( $T_s$ TYP)	150°C
- Temperature Maximum ( $T_s$ MAX)	N/A
- Time ( $t_s$ MIN)	30 - 60 Seconds
<b>Ramp-up Rate (<math>T_L</math> to <math>T_P</math>)</b>	5°C/Second Maximum
<b>Time Maintained Above:</b>	
- Temperature ( $T_L$ )	150°C
- Time ( $t_L$ )	200 Seconds Maximum
<b>Peak Temperature (<math>T_P</math>)</b>	245°C Maximum
<b>Target Peak Temperature (<math>T_P</math> Target)</b>	245°C Maximum 1 Time / 235°C Maximum 2 Times
<b>Time within 5°C of actual peak (<math>t_p</math>)</b>	5 Seconds Maximum 1 Time / 15 Seconds Maximum 2 Times
<b>Ramp-down Rate</b>	5°C/Second Maximum
<b>Time 25°C to Peak Temperature (t)</b>	N/A
<b>Moisture Sensitivity Level</b>	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.