

**EV32C4B3A1-38.880M TR** [Click part number to visit Part Number Details page](#)
**REGULATORY COMPLIANCE** (Data Sheet downloaded on Nov 22, 2017)

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**ITEM DESCRIPTION**

Voltage Controlled Quartz Crystal Clock Oscillators VCXO LVCMOS (CMOS) 3.3Vdc 6 Pad 3.2mm x 5.0mm Ceramic Surface Mount (SMD) 38.880MHz  $\pm 50$ ppm Maximum -40°C to +85°C  $\pm 50$ ppm Minimum 10% Typical, 20% Maximum

**ELECTRICAL SPECIFICATIONS**

<b>Nominal Frequency</b>	38.880MHz
<b>Frequency Tolerance/Stability</b>	$\pm 50$ 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.)
<b>Aging at 25°C</b>	$\pm 2$ ppm/First Year Typical, $\pm 10$ ppm/10 Years Maximum
<b>Operating Temperature Range</b>	-40°C to +85°C
<b>Supply Voltage</b>	3.3Vdc $\pm 10\%$
<b>Input Current</b>	15mA Maximum
<b>Output Voltage Logic High (Voh)</b>	90% of Vdd Minimum (IOH = -4mA)
<b>Output Voltage Logic Low (Vol)</b>	10% of Vdd Maximum (IOL = +4mA)
<b>Rise/Fall Time</b>	5nSec Maximum (Measured at 20% to 80% of Waveform)
<b>Duty Cycle</b>	50 $\pm 10\%$ (Measured at 50% of Waveform)
<b>Load Drive Capability</b>	15pF Maximum
<b>Output Logic Type</b>	CMOS
<b>Absolute Pull Range</b>	$\pm 50$ 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).)
<b>Control Voltage</b>	0.3Vdc to 3.0Vdc (Test Condition for APR)
<b>Control Voltage Range</b>	0.0Vdc to Vdd
<b>Linearity</b>	10% Typical, 20% Maximum
<b>Transfer Function</b>	Positive Transfer Characteristic
<b>Modulation Bandwidth</b>	10kHz Minimum (Measured at -3dB, Vc = 1.65Vdc)
<b>Input Impedance</b>	50kOhms Minimum
<b>Input Leakage Current</b>	10 $\mu$ A Maximum
<b>Phase Noise</b>	All Values are Typical -65dBc/Hz at offset of 10Hz -95dBc/Hz at offset of 100Hz -120dBc/Hz at offset of 1kHz -142dBc/Hz at offset of 10kHz -152dBc/Hz at offset of 100kHz -154dBc/Hz at offset of 1MHz
<b>Tri-State Input Voltage (Vih and Vil)</b>	90% of Vdd Minimum or No Connect to Enable Output, 10% of Vdd Maximum to Disable Output (High Impedance)
<b>RMS Phase Jitter</b>	1pSec Maximum (Fj = 12kHz to 20MHz; Random)
<b>Start Up Time</b>	10mSec Maximum
<b>Storage Temperature Range</b>	-55°C to +125°C

**ENVIRONMENTAL & MECHANICAL SPECIFICATIONS**

<b>ESD Susceptibility</b>	MIL-STD-883, Method 3015, Class 1, HBM: 1500V
<b>Fine Leak Test</b>	MIL-STD-883, Method 1014, Condition A
<b>Flammability</b>	UL94-V0
<b>Gross Leak Test</b>	MIL-STD-883, Method 1014, Condition C
<b>Mechanical Shock</b>	MIL-STD-883, Method 2002, Condition B

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<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	No Connect
3	Case/Ground
4	Output
5	Tri-State
6	Supply Voltage

LINE	MARKING
1	<b>E38.880</b> <i>E=Ecliptek Designator</i>
2	<b>XXXXX</b> <i>XXXXX=Ecliptek Manufacturing Identifier</i>

### Suggested Solder Pad Layout

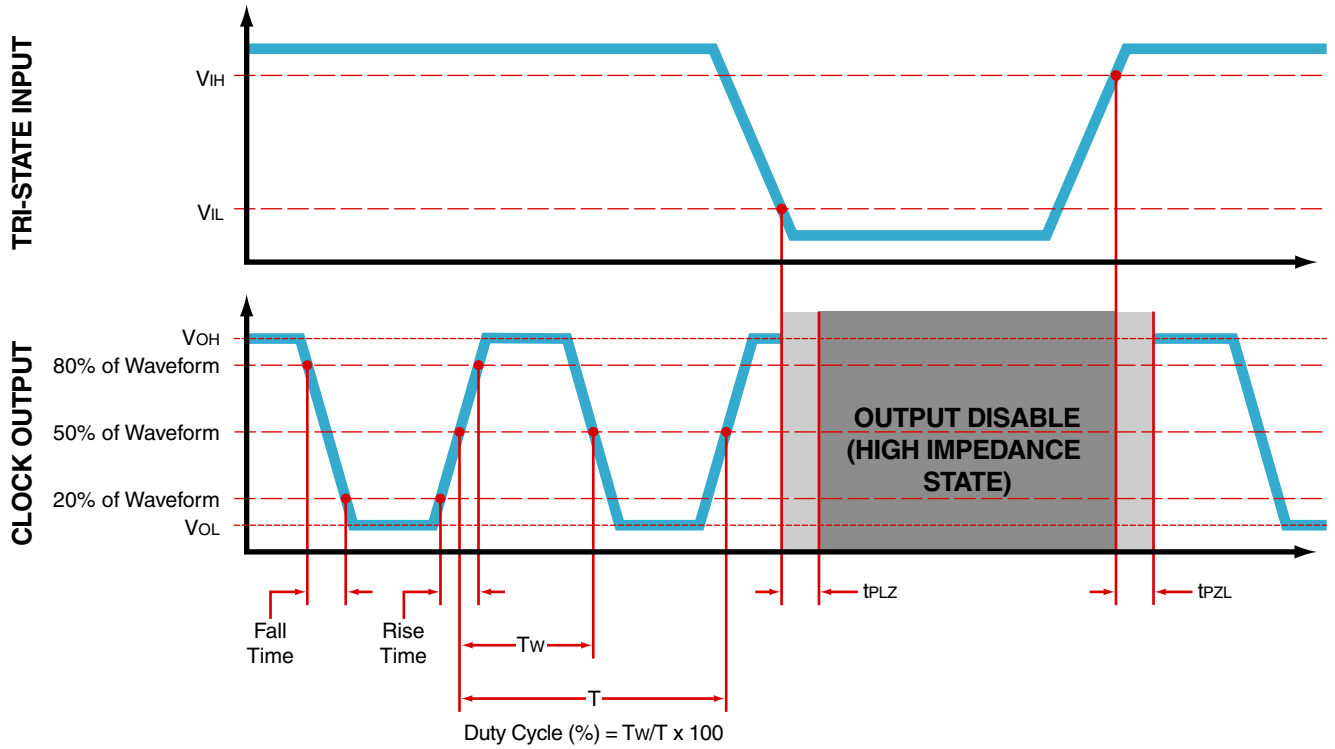
All Dimensions in Millimeters



All Tolerances are ±0.1

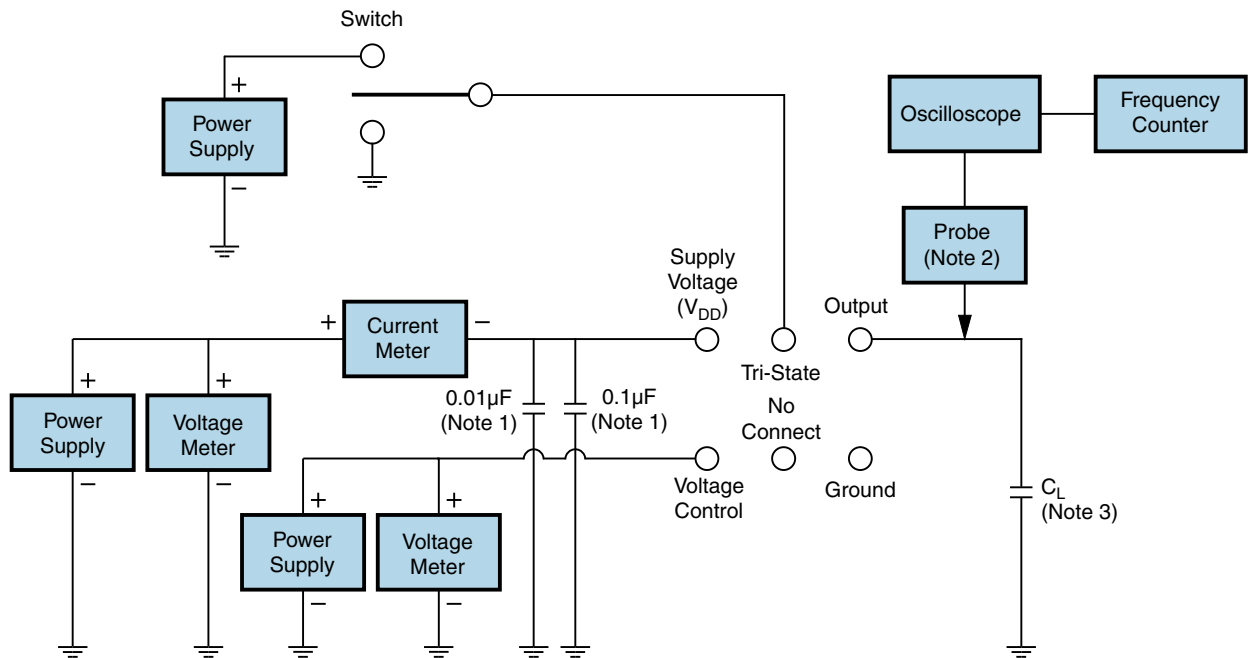
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**OUTPUT WAVEFORM & TIMING DIAGRAM**



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## 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 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.

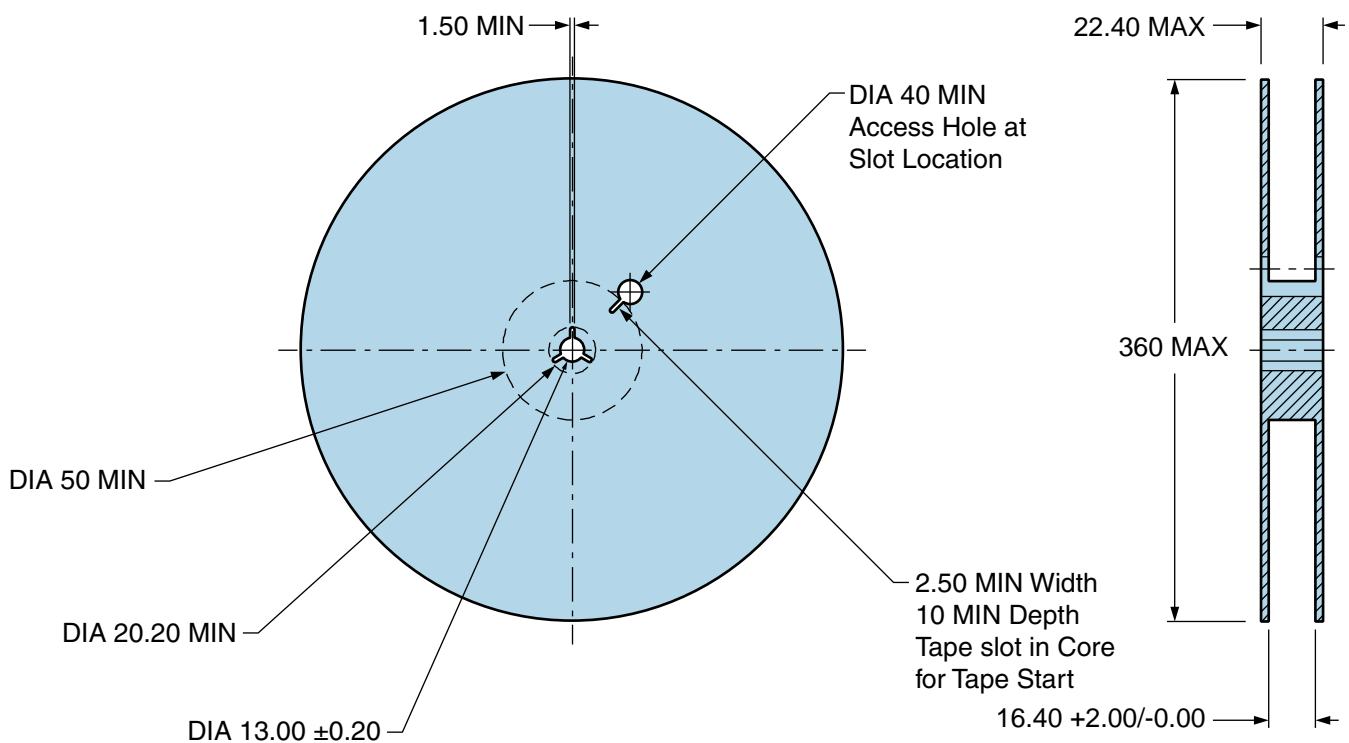
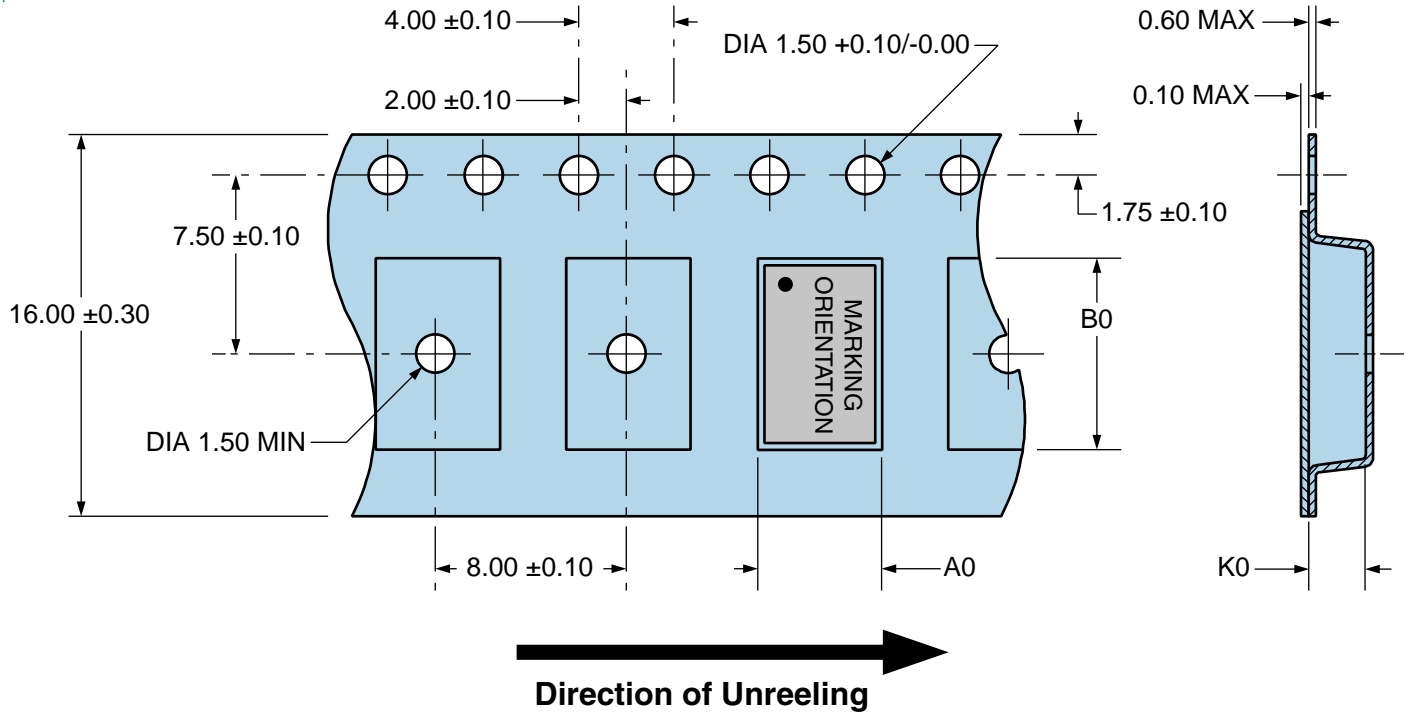
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## Tape & Reel Dimensions

Quantity Per Reel: 1,000 units

All Dimensions in Millimeters

Compliant to EIA-481



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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
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#### 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
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#### Time Maintained Above:

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

<b>Peak Temperature (Tp)</b>	260°C Maximum for 10 Seconds Maximum
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<b>Target Peak Temperature (Tp Target)</b>	250°C +0/-5°C
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<b>Time within 5°C of actual peak (tp)</b>	20 - 40 Seconds
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<b>Ramp-down Rate</b>	6°C/Second Maximum
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<b>Time 25°C to Peak Temperature (t)</b>	8 Minutes Maximum
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<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
<b>Preheat</b>	
- Temperature Minimum (Ts MIN)	N/A
- Temperature Typical (Ts TYP)	150°C
- Temperature Maximum (Ts MAX)	N/A
- Time (ts MIN)	60 - 120 Seconds
<b>Ramp-up Rate (Tl to Tp)</b>	5°C/Second Maximum
<b>Time Maintained Above:</b>	
- Temperature (Tl)	150°C
- Time (tL)	200 Seconds Maximum
<b>Peak Temperature (Tp)</b>	240°C Maximum
<b>Target Peak Temperature (Tp Target)</b>	240°C Maximum 2 Times / 230°C Maximum 1 Time
<b>Time within 5°C of actual peak (tp)</b>	10 Seconds Maximum 2 Times / 80 Seconds Maximum 1 Time
<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.