EB13E2 Series Oscillator

Quartz Crystal Clock Oscillators XO (SPXO) LVCMOS (CMOS) 3.3Vdc 4 Pad 2.5mm x 3.2mm Ceramic Surface Mount (SMD)

Revision O 12/05/2014

Electrical Specifications

Nominal Frequency	1.024MHz to 66.6666MHz *Some frequencies within this range may not be available.*
Frequency Tolerance/Stability	(Inclusive of all conditions: Calibration Tolerance at 25°C, Frequency Stability over the Operating Temperature Range, Supply Voltage Change, Output Load Change, First Year Aging at 25°C, Shock, and Vibration) ±100ppm Maximum ±50ppm Maximum ±25ppm Maximum ±20ppm Maximum
Operating Temperature Range	-20°C to +70°C -40°C to +85°C
Supply Voltage (V_{DD})	3.3V_{DC} ±5%
Input Current	Click to Open Input Current Table
Output Voltage Logic High (V_{OH})	I_{OH}= -4mA 90% of V_{DD} Minimum
Output Voltage Logic Low (V_{OL})	I_{OL}= +4mA 10% of V_{DD} Maximum
Duty Cycle	Measured at 50% of waveform 50 ±5(%)
Rise Time/Fall Time	Click to Open Rise/Fall Time Table
Output Logic Type	CMOS
Load Drive Capability	15pF Maximum
Storage Temperature Range	-55°C to +125°C
Pin 1 Connection	Tri-State (High Impedance)
Tri-State Input Voltage (V_{IH} and V_{IL})	80% of V_{DD} Minimum or No Connect to Enable Output, 20% of V_{DD} Maximum to Disable Output (High Impedance)
RMS Phase Jitter	Fj = 12kHz to 20MHz 1pSec Maximum
Start Up Time	10mSec Maximum
Standby Current	Disabled Output: High Impedance 10µA Maximum

Input Current

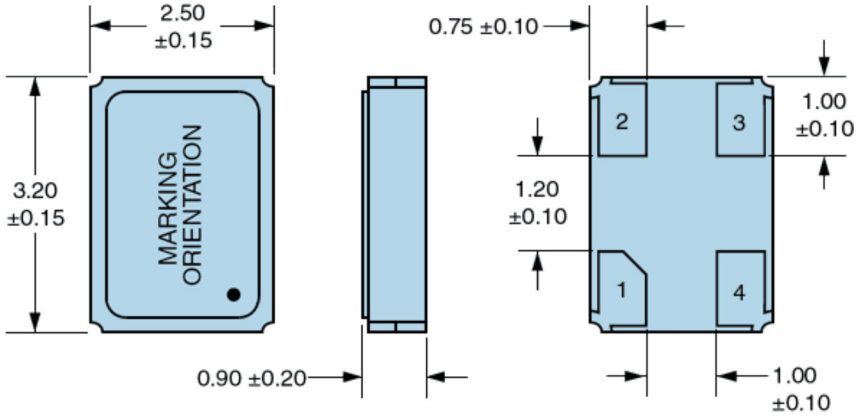
Nominal Frequency Range	*Input Current*
1.024MHz to 9.999999MHz	3mA Maximum
10MHz to 19.999999MHz	4mA Maximum
20MHz to 39.999999MHz	5mA Maximum
40MHz to 50MHz	6mA Maximum
50.000001MHz to 66.6666MHz	9mA Maximum

Rise/Fall Time

Measured at 20% to 80% of Waveform

Nominal Frequency Range	*Rise/Fall Time*
1.024MHz to 24MHz	5nSec Maximum
24.000001MHz to 50MHz	4nSec Maximum
50.000001MHz to 66.6666MHz	3nSec Maximum

Mechanical Dimensions



All Dimensions in Millimeters

Pin 1: Tri-State

Pin 2: Case/Ground

Pin 3: Output

Pin 4: Supply Voltage

Marking Specifications

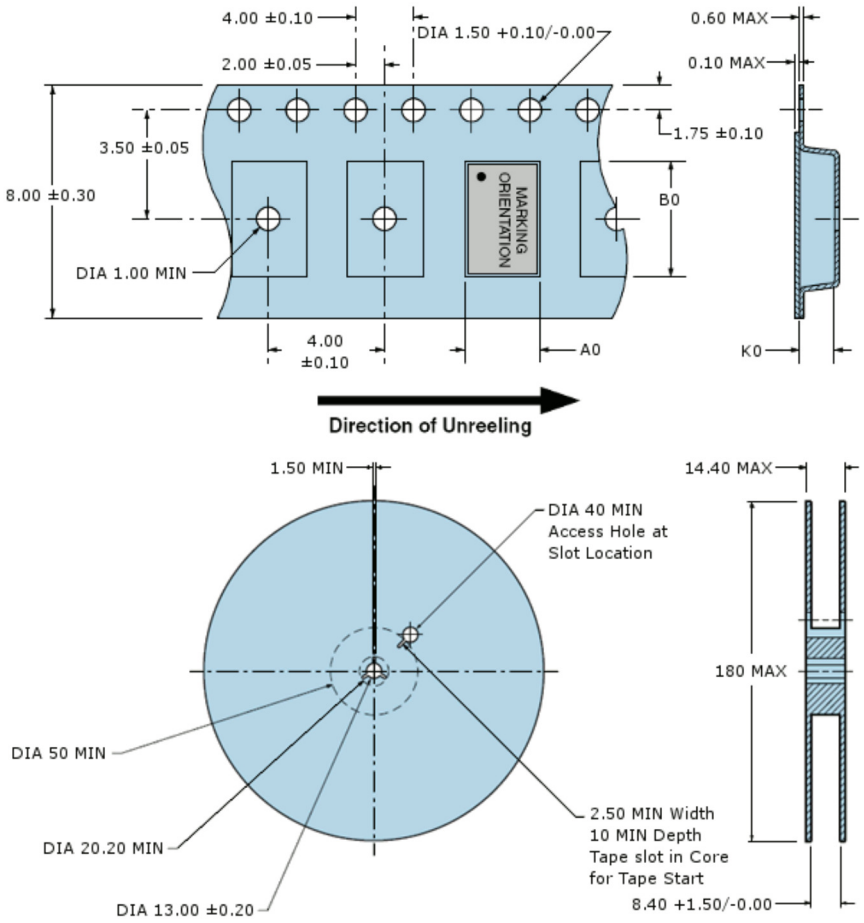
Line 1: **EXXXX**
- E = Ecliptek Designator
- XXXX = Nominal Frequency in MHz (3 Digits + Decimal)

Line 2: **XXXXX**
- XXXXX = Ecliptek Manufacturing Identifier

Environmental and Mechanical Specifications

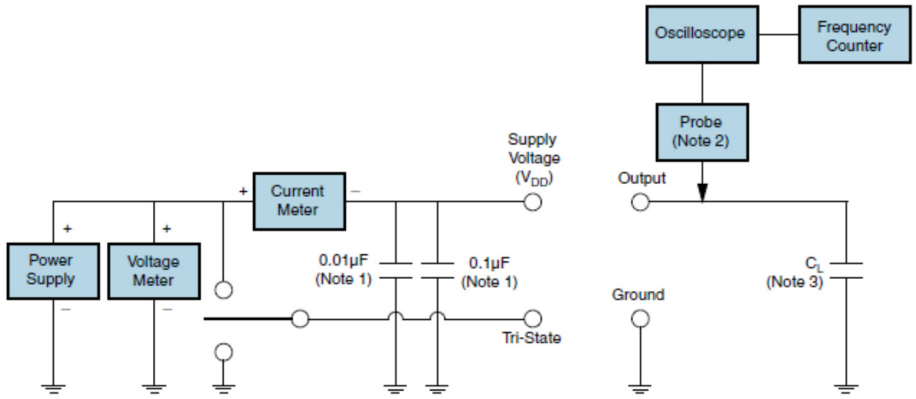
ESD Susceptibility	MIL-STD-883, Method 3015, Class 1, HBM:1500V
Fine Leak Test	MIL-STD-883, Method 1014, Condition A
Flammability	UL94-V0
Gross Leak Test	MIL-STD-883, Method 1014, Condition C
Mechanical Shock	MIL-STD-883, Method 2002, Condition B
Moisture Resistance	MIL-STD-883, Method 1004
Moisture 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
Thermal Resistance (θ_{JA})	40°C/W (degrees Celsius per Watt)
Thermal Resistance (θ_{JC})	14°C/W (degrees Celsius per Watt)

Tape & Reel Dimensions



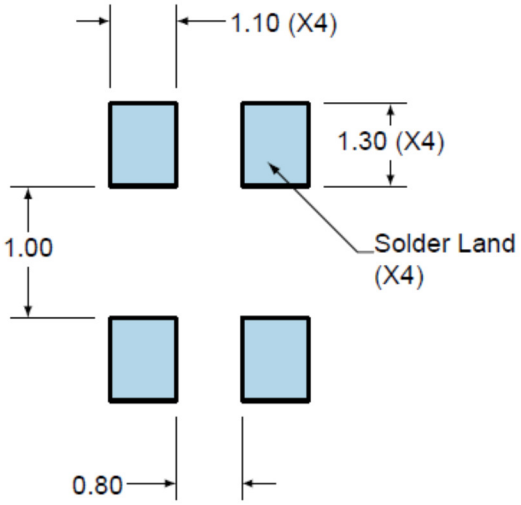
1000 pieces per reel
Compliant to EIA-481
All Dimensions in Millimeters

CMOS Test Circuit



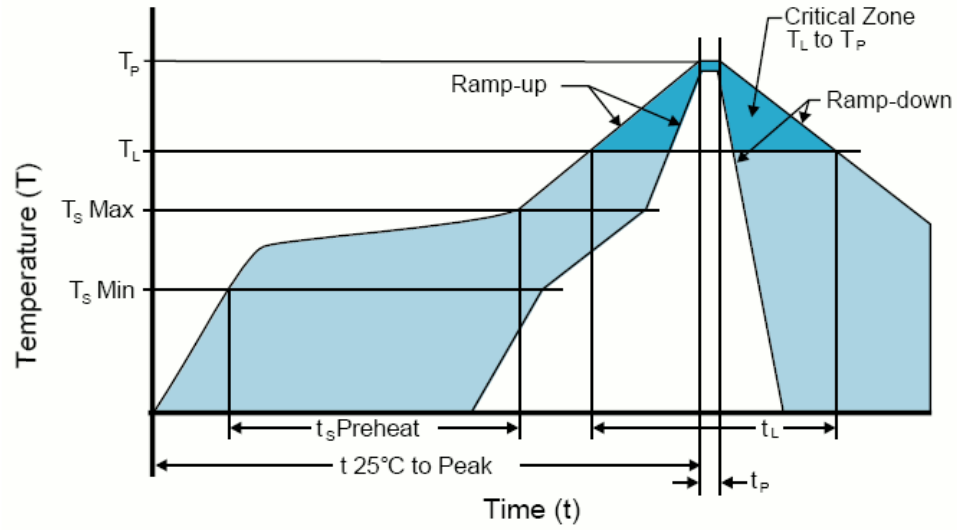
Note 1: An external 0.1µF low frequency tantalum bypass capacitor in parallel with a 0.01µF high frequency ceramic bypass capacitor close to the package ground and V_{DD} pin is required.
Note 2: A low input capacitance (<12pF), 10X Attentuation Factor, High Impedance (>10Mohms), and High bandwidth (>300MHz) passive probe is recommended.
Note 3: Capacitance value C_L includes sum of all probe and fixture capacitance. See applicable specification sheet for 'Load Drive Capability'.

Recommended Solder Pad Dimensions



Tolerances = ±0.1
All Dimensions in Millimeters

Solder Reflow Profile



High Temperature Infrared/Convection

Note: Temperatures shown are applied to body of device.

T_S MAX to T_L (Ramp-up Rate)	3°C/second Maximum
Preheat	
- Temperature Minimum (T_S MIN)	150°C
- Temperature Typical (T_S TYP)	175°C
- Temperature Maximum (T_S MAX)	200°C
- Time (t_S)	60 - 180 Seconds
Ramp-up Rate (T_L to T_P)	3°C/second Maximum
Time Maintained Above:	
- Temperature (T_L)	217°C
- Time (t_L)	60 - 150 Seconds
Peak Temperature (T_P)	260°C Maximum for 10 Seconds Maximum
Target Peak Temperature (T_P Target)	250°C +0/-5°C
Time within 5°C of actual peak (t_P)	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

Low Temperature Infrared/Convection

Note: Temperatures shown are applied to body of device.

T_S MAX to T_L (Ramp-up Rate)	5°C/second Maximum
Preheat	
- Temperature Minimum (T_S MIN)	N/A
- Temperature Typical (T_S TYP)	150°C
- Temperature Maximum (T_S MAX)	N/A
- Time (t_S)	60 - 120 Seconds
Ramp-up Rate (T_L to T_P)	5°C/second Maximum
Time Maintained Above:	
- Temperature (T_L)	150°C
- Time (t_L)	200 Seconds Maximum
Peak Temperature (T_P)	240°C Maximum
Target Peak Temperature (T_P Target)	240°C Maximum 2 Times / 230°C Maximum 1 Time
Time within 5°C of actual peak (t_P)	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

High Temperature Manual Soldering

Note: Temperatures listed are applied to body of device.
260°C Maximum for 5 seconds Maximum, 2 times Maximum.

Low Temperature Manual Soldering

Note: Temperatures listed are applied to body of device.
185°C Maximum for 10 seconds Maximum, 2 times Maximum.

1 - Build A Part Number

Select the parameters that meet your requirements and then click Next

Frequency in Megahertz (1.024 to 66.6666):
Some frequencies within this range may not be available

Frequency Tolerance/Stability: ±100ppm Maximum over -20°C to +70°C

Packaging Options: Tape & Reel

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Access these Part Number specific resources and tools

- P/N Specific Data Sheet
- Automated Quick Quote
- Request Sample
- Download IPC-1752
- My Parts List
- My Part Number

Part Numbering Guide

EB13E2 C 2 H -20.000M TR

Series
Quartz Crystal Clock Oscillators XO (SPXO) LVCMOS (CMOS) 3.3Vdc 4 Pad 2.5mm x 3.2mm Ceramic Surface Mount (SMD)

Frequency Tolerance/Stability
C = ±100ppm Maximum over -20°C to +70°C
D = ±50ppm Maximum over -20°C to +70°C
E = ±25ppm Maximum over -20°C to +70°C
F = ±20ppm Maximum over -20°C to +70°C
G = ±100ppm Maximum over -40°C to +85°C
H = ±50ppm Maximum over -40°C to +85°C
J = ±25ppm Maximum over -40°C to +85°C
K = ±20ppm Maximum over -40°C to +85°C

Duty Cycle
2 = 50 ±5(%)

Pin 1 Connection
H = Tri-State (High Impedance)

Nominal Frequency

Packaging Options
Blank = Bulk (Cut Tape)
TR = Tape & Reel

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