EP25 Series Oscillator

Quartz Crystal Clock Oscillators XO (SPXO) HCMOS/TTL (CMOS) 5.0Vdc 4 Pad 5.0mm x 7.0mm Ceramic Surface Mount (SMD)

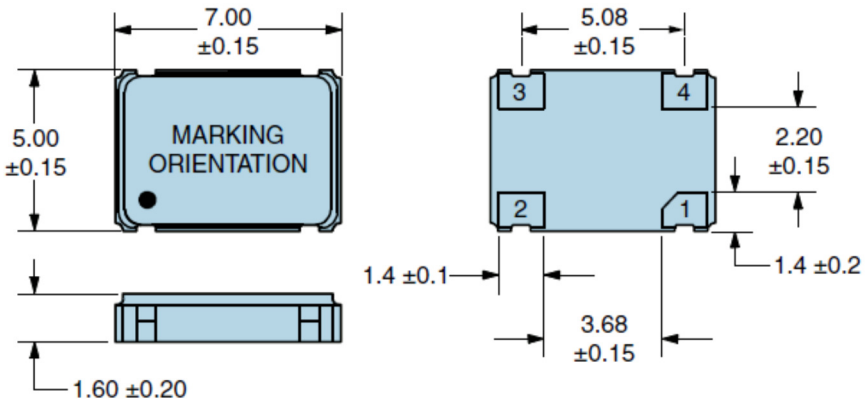
Revision H 03/25/2014

Electrical Specifications

Nominal Frequency	1.000MHz to 125.000MHz *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
Operating Temperature Range	-20°C to +70°C -40°C to +85°C
Supply Voltage (V_{DD})	5.0V_{DC} ±10%
Input Current	45mA Maximum (Unloaded)
Output Voltage Logic High (V_{OH})	IOH = -16mA V_{DD}-0.4V_{DC} Minimum at Output Logic Type of CMOS 2.4V_{DC} Minimum at Output Logic Type of TTL
Output Voltage Logic Low (V_{OL})	IOL = +16mA 0.4V_{DC} Maximum
Duty Cycle	Measured at 1.4V_{DC} with TTL Load or 50% of waveform with HCMOS Load 50 ±10(%) 50 ±5(%) (Not available with Output Logic Type of TTL over Nominal Frequency of 27.000001MHz to 125MHz; Not available with Output Logic Type of CMOS over Nominal Frequency of 50.000001MHz to 125MHz)
Rise Time/Fall Time	4nSec Maximum (Measured at 20% to 80% of waveform) at Output Logic Type of CMOS 4nSec Maximum (Measured at 0.8V_{DC} to 2.0V_{DC}) at Output Logic Type of TTL
Load Drive Capability	50pF HCMOS Load Maximum over Nominal Frequency of 1MHz to 50MHz at Output Logic Type of CMOS 15pF HCMOS Load Maximum over Nominal Frequency of 50.000001MHz to 125MHz at Output Logic Type of CMOS 10TTL Load Maximum over Nominal Frequency of 1MHz to 40MHz at Output Logic Type of TTL 5TTL Load Maximum over Nominal Frequency of 40.000001MHz to 125MHz at Output Logic Type of TTL
Output Logic Type	CMOS TTL
Pin 1 Connection	Power Down (Disabled Output: Logic Low) Tri-State (Disabled Output: High Impedance)
Pin 1 Input Voltage (Vih and Vil)	+2.0V_{DC} Minimum to enable output, +0.8V_{DC}Maximum to disable output, No Connect to enable output.

Standby Current	50µA Maximum (Pin 1 = Ground)
Disable Current	30mA Maximum (Pin 1 = Ground)
Absolute Clock Jitter	±250pSec Maximum, ±100pSec Typical over Nominal Frequency of 1MHz to 33MHz ±100pSec Maximum, ±50pSec Typical over Nominal Frequency of 33.000001MHz to 125MHz
One Sigma Clock Period Jitter	±50pSec Maximum over Nominal Frequency of 1MHz to 33MHz ±30pSec Maximum over Nominal Frequency of 33.000001MHz to 125MHz
Aging (at 25°C)	±5ppm/year Maximum
Storage Temperature Range	-55°C to +125°C
Start Up Time	10mSec Maximum

Mechanical Dimensions



All Dimensions in Millimeters

Pin 1: Power Down (Logic Low) or Tri-State (High Impedance)

Pin 2: Ground/Case Ground

Pin 3: Output

Pin 4: Supply Voltage

Marking Specifications

Line 1: **ECLIPTEK**

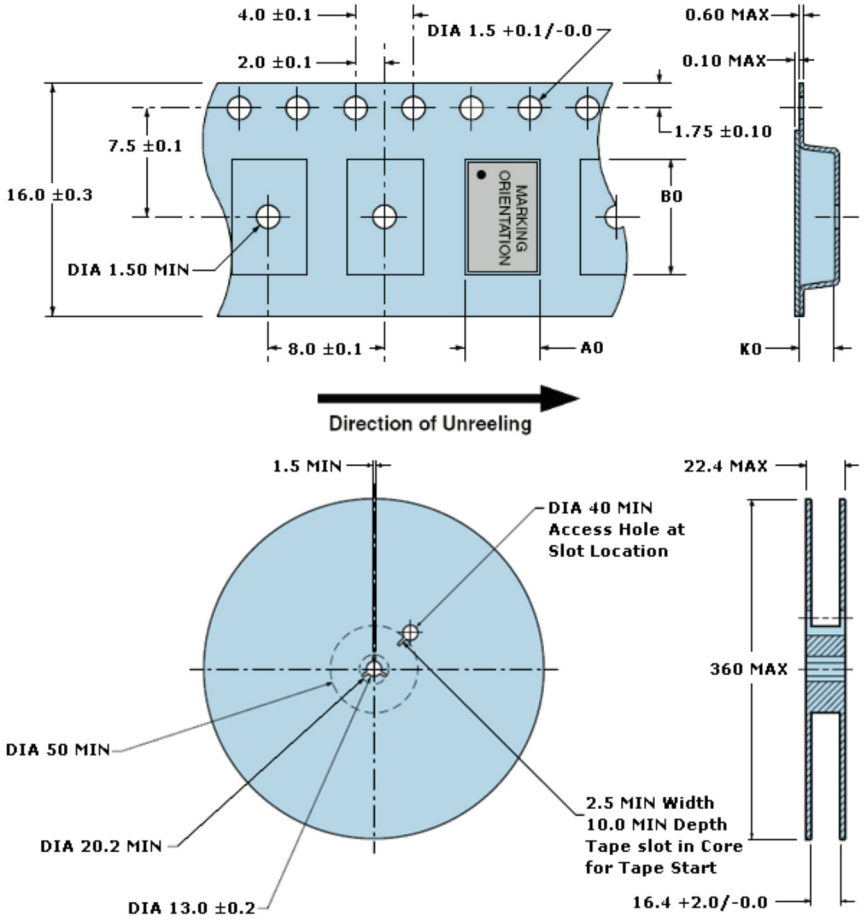
Line 2: **XXXXXXM**
- XXXXXX = Nominal Frequency (5 Digits + Decimal)
- M = Frequency unit of measure (MHz)

Line 3: **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})	42°C/W (degrees Celsius per Watt)
Thermal Resistance (θ_{JC})	15°C/W (degrees Celsius per Watt)

Tape & Reel Dimensions

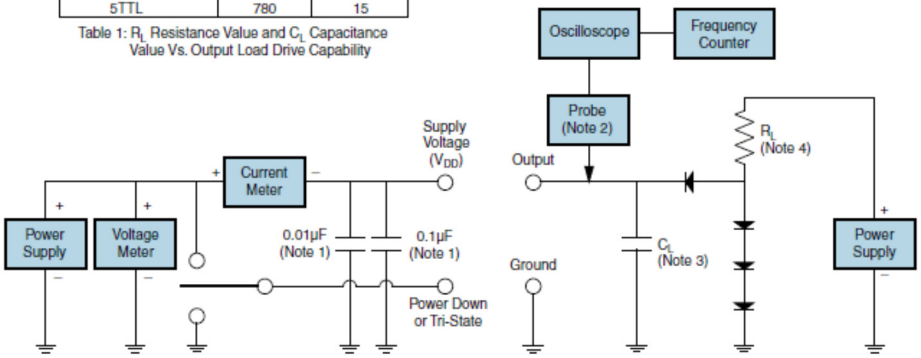


1000 pieces per reel
Compliant to EIA-481
All Dimensions in Millimeters

TTL Test Circuit

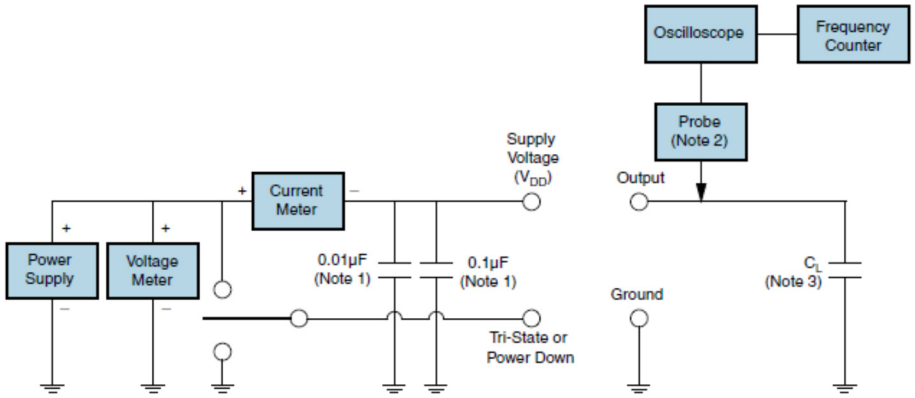
Output Load Drive Capability	R_L Value (Ohms)	C_L Value (pF)
10TTL	390	15
5TTL	780	15

Table 1: R_L Resistance Value and C_L Capacitance Value Vs. Output Load Drive Capability



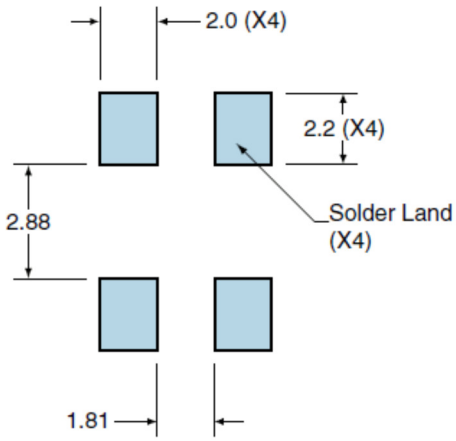
Note 1: An external 0.1µF low frequency tantalum bypass capacitor in parallel with a 0.01µF high frequency ceramic bypass capacitor close to the package ground and V_{DD} pin is required.
Note 2: A low input capacitance (<12pF), 10X Attentuation Factor, High Impedance (>10Mohms), and High bandwidth (>300MHz) passive probe is recommended.
Note 3: Capacitance value C_L includes sum of all probe and fixture capacitance.
Note 4: Resistance value R_L is shown in Table I. See applicable specification sheet for â€˜Load Drive Capabilityâ€™.
Note 5: All diodes are MMBD7000, MMBD914, or equivalent.

CMOS Test Circuit



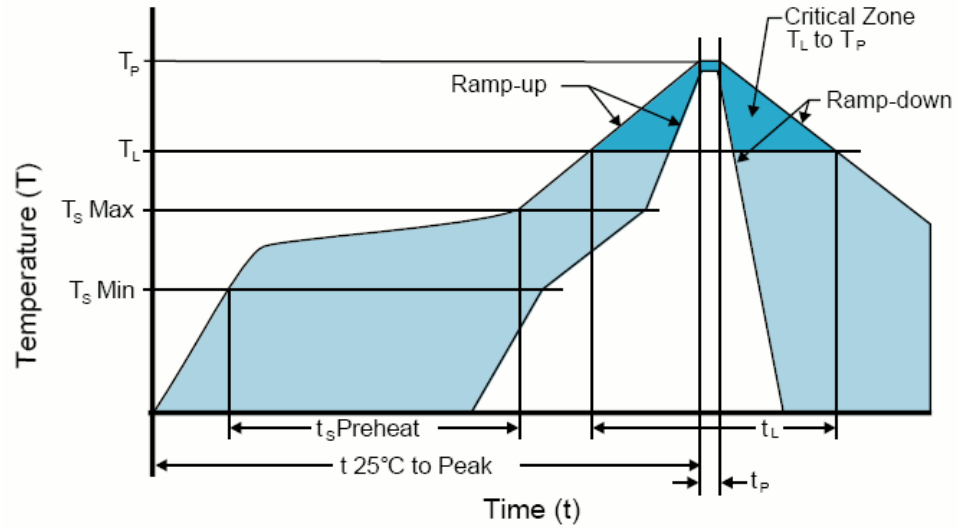
Note 1: An external 0.1µF low frequency tantalum bypass capacitor in parallel with a 0.01µF high frequency ceramic bypass capacitor close to the package ground pin is required.
Note 2: A low input capacitance (<12pF), 10X Attentuation Factor, High Impedance (>10Mohms), and High bandwidth (>300MHz) passive probe is recommended.
Note 3: Capacitance value 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 to 125): *Some frequencies within this range may not be available*	
Frequency Tolerance/Stability:	±100ppm Maximum
Operating Temperature Range:	-20°C to +70°C
Duty Cycle:	50 ±10%
Pin 1 Connection:	Power Down (Disabled Output: Logic Low)
Output Logic Type:	CMOS
Packaging Options:	Tape & Reel

Next

2 - Next Page

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

EP25 00 ET T TS L -24.000M TR

Series
Quartz Crystal Clock Oscillators XO (SPXO)
HCMOS/TTL (CMOS) 5.0Vdc 4 Pad 5.0mm x 7.0mm
Ceramic Surface Mount (SMD)

Frequency Tolerance/Stability
00 = ±100ppm Maximum
45 = ±50ppm Maximum

Operating Temperature Range
Blank = -20°C to +70°C
ET = -40°C to +85°C

Duty Cycle
Blank = 50 ±10(%)
T = 50 ±5(%)

Pin 1 Connection
PD = Power Down (Disabled Output: Logic Low)
TS = Tri-State (Disabled Output: High Impedance)

Output Logic Type
C = CMOS
L = TTL

Nominal Frequency

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