EQVA13 Series Oscillator

Voltage Controlled Quartz Crystal Clock Oscillators VCXO LVCMOS (CMOS) 3.3Vdc 6 Pad 5.0mm x 7.0mm Ceramic Surface Mount (SMD)

Revision A 07/24/2014

Electrical Specifications

Nominal Frequency	10.000MHz to 200.000MHz *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 and Output Load Change ±50ppm Maximum
Operating Temperature Range	0°C to +70°C -20°C to +70°C -40°C to +85°C
Aging at 25°C	±2ppm Maximum First Year, ±10ppm/10 Years Maximum
Supply Voltage	$3.3V_{DC}$ ±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 ±10(%) 50 ±5(%)
Rise Time/Fall Time	Measured at 10% to 90% of Waveform 3nSec Maximum
Load Drive Capability	15pF Maximum
Output Logic Type	CMOS
Absolute Pull Range	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 10 Year Aging over the Control Voltage (Vc) ±30ppm Minimum ±50ppm Minimum
Control Voltage	Test Condition for APR $0.3V_{DC}$ to $3.0V_{DC}$
Control Voltage Range	$0.0V_{DC}$ to V_{DD} +$0.6V_{DC}$
Linearity	5% Typical, 10% Maximum
Transfer Function	Positive Tranfer Characteristic
Modulation Bandwidth	Measured at -3dB, Vc = $1.65V_{DC}$ 10kHz Minimum

Input Impedance	500kOhms Minimum
Input Leakage Current	10µA Maximum
Phase Noise	Click to Open Phase Noise Table
Output Control Function	Output Enable (OE)
Output Control Input Voltage Logic High (Vih)	90% of V_{DD} Minimum or No Connect to Enable Output
Output Control Input Voltage Logic Low (Vil)	10% of V_{DD} Maximum to Disable Output (High Impedance)
Output Enable Time	100nSec Maximum
Output Disable Time	50nSec Maximum
Output Enable Current	Without Load (Pin 2 = Ground) 18mA Maximum
RMS Phase Jitter	Click to Open RMS Phase Jitter Table
Period Jitter (Deterministic)	0.2pSec Typical
Period Jitter (Random)	2pSec Typical
Period Jitter (RMS)	3pSec Maximum
Period Jitter (pk-pk)	30pSec Maximum
Storage Temperature Range	-55°C to +125°C
Start Up Time	10mSec Maximum

Input Current

Unloaded

Nominal Frequency Range	*Input Current*
10MHz to 50MHz	20mA Maximum
50.000001MHz to 100MHz	25mA Maximum
100.000001MHz to 200MHz	30mA Maximum

Phase Noise

All Values are Typical

Nominal Frequency: 10MHz to 50MHz

Offset	*Phase Noise*
10Hz	-64dBc/Hz
100Hz	-96dBc/Hz
1kHz	-124dBc/Hz
10kHz	-131dBc/Hz
100kHz	-132dBc/Hz
1MHz	-149dBc/Hz
10MHz	-157dBc/Hz
20MHz	-159dBc/Hz

Nominal Frequency: 50.000001MHz to 100MHz

Offset	*Phase Noise*
10Hz	-58dBc/Hz
100Hz	-90dBc/Hz
1kHz	-118dBc/Hz
10kHz	-125dBc/Hz
100kHz	-126dBc/Hz
1MHz	-145dBc/Hz
10MHz	-155dBc/Hz
20MHz	-157dBc/Hz

Nominal Frequency: 100.000001MHz to 156.249999MHz

Offset	*Phase Noise*
10Hz	-57dBc/Hz
100Hz	-86dBc/Hz
1kHz	-114dBc/Hz
10kHz	-121dBc/Hz
100kHz	-122dBc/Hz
1MHz	-141dBc/Hz
10MHz	-151dBc/Hz
20MHz	-153dBc/Hz

Nominal Frequency: 156.25MHz to 200MHz

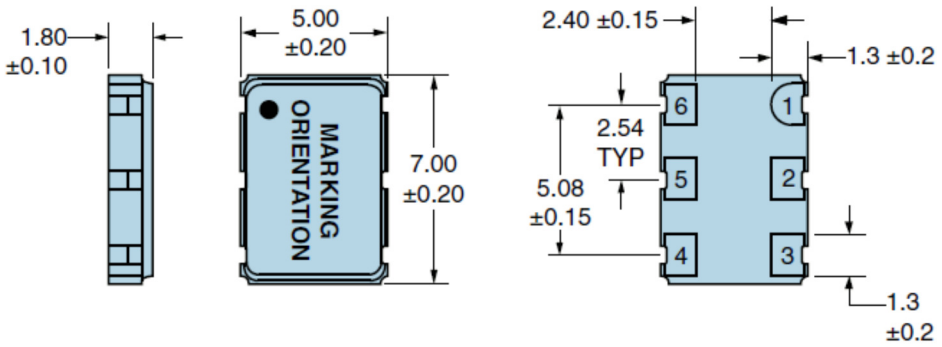
Offset	*Phase Noise*
10Hz	-58dBc/Hz
100Hz	-86dBc/Hz
1kHz	-110dBc/Hz
10kHz	-116dBc/Hz
100kHz	-117dBc/Hz
1MHz	-136dBc/Hz
10MHz	-146dBc/Hz
20MHz	-148dBc/Hz

RMS Phase Jitter

Fj=12kHz to 20MHz (Random)

Nominal Frequency Range	*RMS Phase Jitter*
10MHz to 50MHz	1.5pSec Maximum
50.000001MHz to 100MHz	1.4pSec Maximum
100.000001MHz to 200MHz	1.3pSec Maximum

Mechanical Dimensions



All Dimensions in Millimeters

Pin 1: Control Voltage

Pin 2: Output Enable (OE)

Pin 3: Case/Ground

Pin 4: Output

Pin 5: Do Not Connect

Pin 6: Supply Voltage

Marking Specifications

Line 1: **ECLIPTEK**

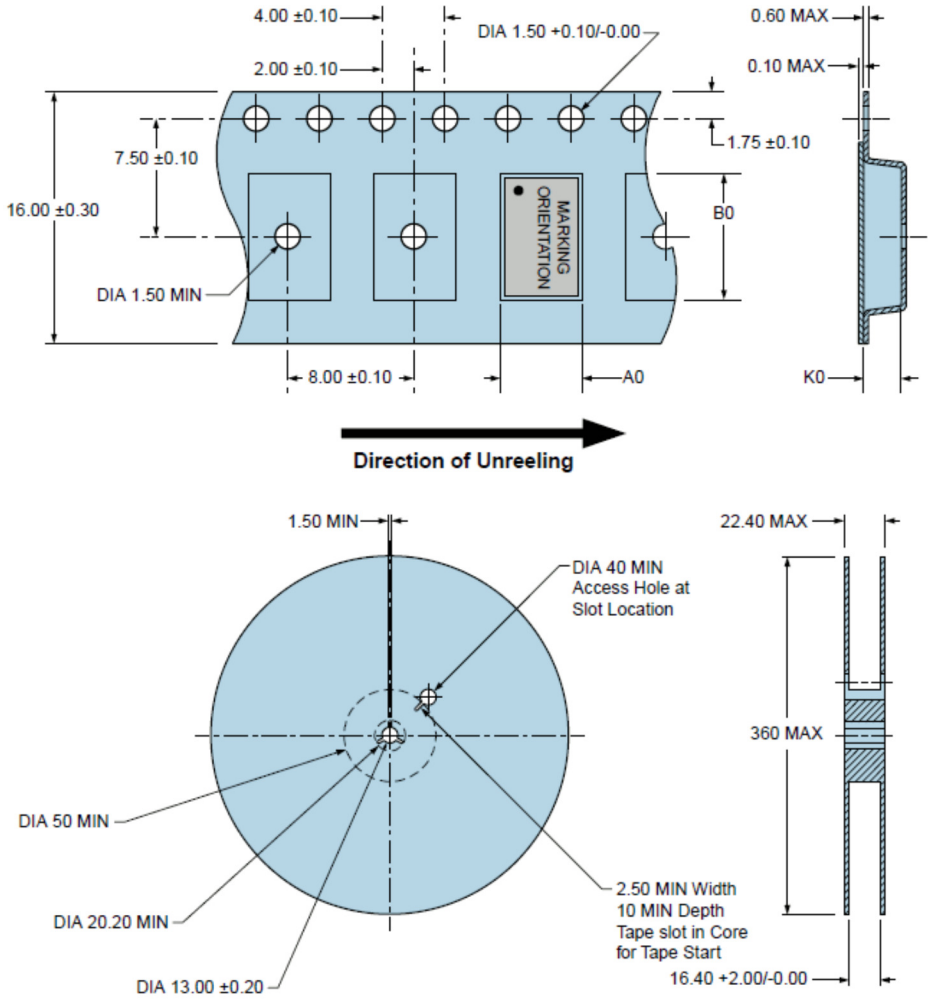
Line 2: **XXXXXXM**
- XXXXXX = Nominal Frequency (5 digits + Decimal)
- M = Frequency Unit of Measure (MHz)

Line 3: **XXXXX**
- XXXXX = Ecliptek Manufacturing Identifier

Environmental and Mechanical Specifications

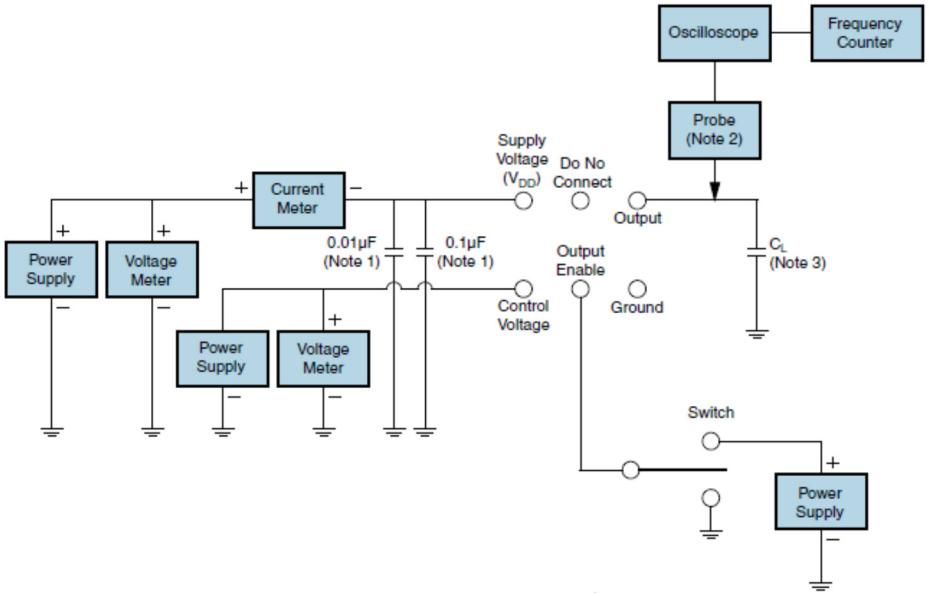
ESD Susceptibility	MIL-STD-883, Method 3015, Class 1, HBM: 1500V
Fine Leak Test	MIL-STD-883, Method 1014, Condition A
Flammability	UL94-V0
Gross Leak Test	MIL-STD-883, Method 1014, Condition C
Mechanical Shock	MIL-STD-883, Method 2002, Condition B
Moisture Resistance	MIL-STD-883, Method 1004
Moisture 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



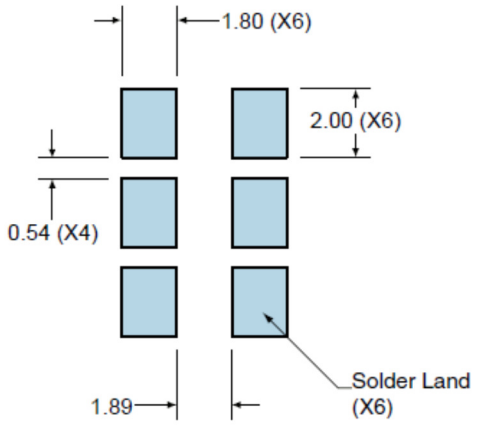
1000 pieces per reel
Compliant to EIA-481
All Dimensions in Millimeters

Test Circuit for CMOS Output



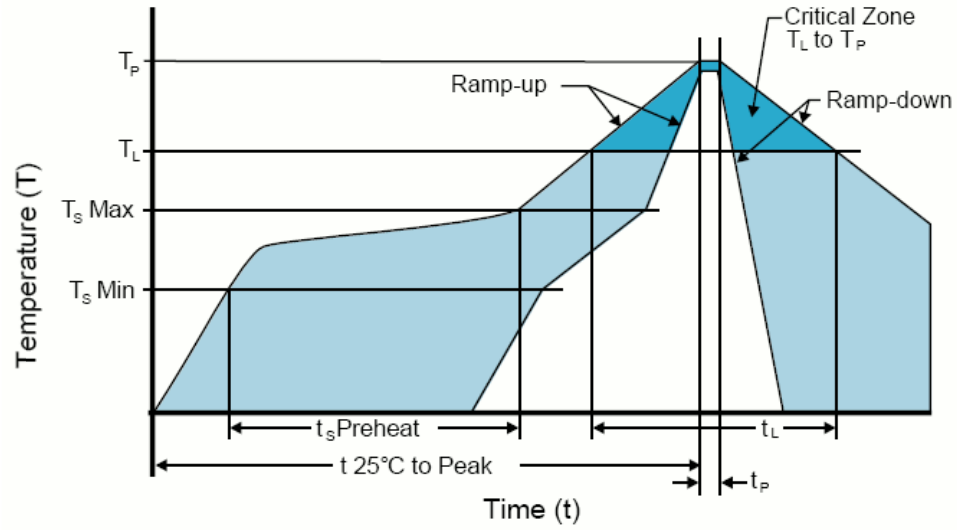
Note 1: An external 0.01µF ceramic bypass capacitor in parallel with a 0.1µF high frequency ceramic bypass capacitor close (less than 2mm) to the package ground and supply voltage pin is required.
Note 2: A low capacitance (<12pF), 10X attentuation factor, high impedance (>10Mohms), and high bandwidth (>300MHz) passive probe is recommended.
Note 3: Capacitance value C_L includes sum of all probe and fixture capacitance.

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 240°C

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 (10 to 200):
Some frequencies within this range may not be available

Operating Temperature Range: 0°C to +70°C

Absolute Pull Range: ±30ppm Minimum

Duty Cycle: 50 ±10(%)

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

EQVA13 A 1 C 2 H -49.152M TR

Series
Voltage Controlled Quartz Crystal Clock Oscillators
VCXO LVCMOS (CMOS) 3.3Vdc 6 Pad 5.0mm x 7.0mm Ceramic Surface Mount (SMD)

Operating Temperature Range
A = 0°C to +70°C
B = -20°C to +70°C
C = -40°C to +85°C

Absolute Pull Range
1 = ±30ppm Minimum
2 = ±50ppm Minimum

Linearity
C = 5% Typical, 10% Maximum

Duty Cycle
1 = 50 ±10(%)
2 = 50 ±5(%)

Output Control Function
H = Output Enable (OE)

Nominal Frequency

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

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