EQUJ32 Series Oscillator

Temperature Compensated Voltage Controlled Quartz Crystal Clock Oscillators TCVCXO LVDS (DS) 2.5Vdc 6 Pad 2.5mm x 3.2mm Ceramic Surface Mount (SMD)

Lead Free COMPLIANT | China RoHS COMPLIANT | EU RoHS COMPLIANT | REACH COMPLIANT

Revision A 09/09/2015

Electrical Specifications

Nominal Frequency	10.000MHz to 625.000MHz *Some frequencies within this range may not be available.*
Frequency Stability	Inclusive of Operating Temperature Range, at V_{DD}=2.5V_{DC}, at V_C=1.5V_{DC} ±5.0ppm Maximum ±3.0ppm Maximum ±2.5ppm Maximum ±2.0ppm Maximum ±1.5ppm Maximum ±1.0ppm Maximum
Frequency Stability vs. Frequency Tolerance	At 25°C ±2°C, at V_{DD}=2.5V_{DC}, at V_C=1.5V_{DC} ±0.1V_{DC}, Pre-Reflow ±2.0ppm Maximum ±1.5ppm Maximum ±1.0ppm Maximum
Frequency Stability vs. Input Voltage	±0.2ppm Maximum (±5%)
Frequency Stability vs. Load	±0.2ppm Maximum (±2pF)
Frequency Stability vs. Reflow	±1.0ppm Maximum (at 25°C, 24 hours after reflow, 1 time)
Frequency Stability vs. Aging	±1ppm/Year Maximum (at 25°C)
Operating Temperature Range	0°C to +50°C -10°C to +60°C 0°C to +70°C -20°C to +70°C -30°C to +60°C -30°C to +75°C -30°C to +85°C -40°C to +85°C
Supply Voltage	2.5V_{DC} ±5%
Input Current	Unloaded 25mA Maximum
Output Voltage Logic High (Voh)	1.425V_{DC} Typical
Output Voltage Logic Low (Vol)	1.075V_{DC} Typical
Differential Output Error (dVod)	50mV_{DC} Maximum
Differential Output Voltage (Vod)	200mV_{DC} Minimum, 350mV_{DC} Typical, 454mV_{DC} Maximum
Offset Voltage (Vos)	1.125V_{DC} Minimum, 1.250V_{DC} Typical, 1.375V_{DC} Maximum

Rise/Fall Time	Measured at 10% to 90% of Waveform 500pSec Maximum
Duty Cycle	Measured at 50% of Waveform 50 ±5(%)
Offset Error (dVos)	50mV_{DC} Maximum
Load Drive Capability	100 Ohms Between Output and Complementary Output
Output Logic Type	LVDS
Control Voltage	1.5V_{DC} ±1.0V_{DC}
Frequency Deviation	±8ppm Minimum
Linearity	10% Maximum
Transfer Function	Positive Transfer Characteristic
Modulation Bandwidth	Measured at -3dB 10kHz Minimum
Input Impedance	1MOhms Minimum
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 and Complementary Output
Output Control Input Voltage Logic Low (Vil)	10% of V_{DD} Maximum to Disable Output and Complementary Output (High Impedance)
Output Enable Time	100nSec Maximum
Output Disable Time	50nSec Maximum
Output Enable Current	Without Load (Pin 2 = Ground) 15mA 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
Start Up Time	10mSec Maximum
Storage Temperature Range	-55°C to +125°C

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 212.5MHz

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

Nominal Frequency: 212.500001MHz to 500MHz

Offset	*Phase Noise*
10Hz	-56dBc/Hz
100Hz	-95dBc/Hz

1kHz	-100dBc/Hz
10kHz	-106dBc/Hz
100kHz	-107dBc/Hz
1MHz	-126dBc/Hz
10MHz	-136dBc/Hz
20MHz	-137dBc/Hz

Nominal Frequency: 500.000001MHz to 625MHz

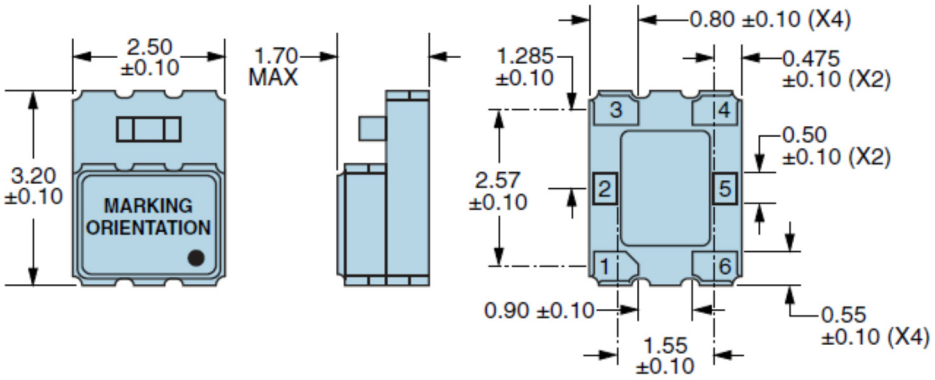
Offset	*Phase Noise*
10Hz	-54dBc/Hz
100Hz	-84dBc/Hz
1kHz	-97dBc/Hz
10kHz	-104dBc/Hz
100kHz	-105dBc/Hz
1MHz	-124dBc/Hz
10MHz	-134dBc/Hz
20MHz	-136dBc/Hz

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 625MHz	1.3pSec Maximum

Mechanical Dimensions



Terminal Plating Thickness: Gold (0.3 to 1.0µm) over Nickel (1.27 to 8.89µm).

All Dimensions in Millimeters

Pin 1: Control Voltage

Pin 2: Output Enable (OE)

Pin 3: Case/Ground

Pin 4: Output

Pin 5: Complementary Output

Pin 6: Supply Voltage

Marking Specifications

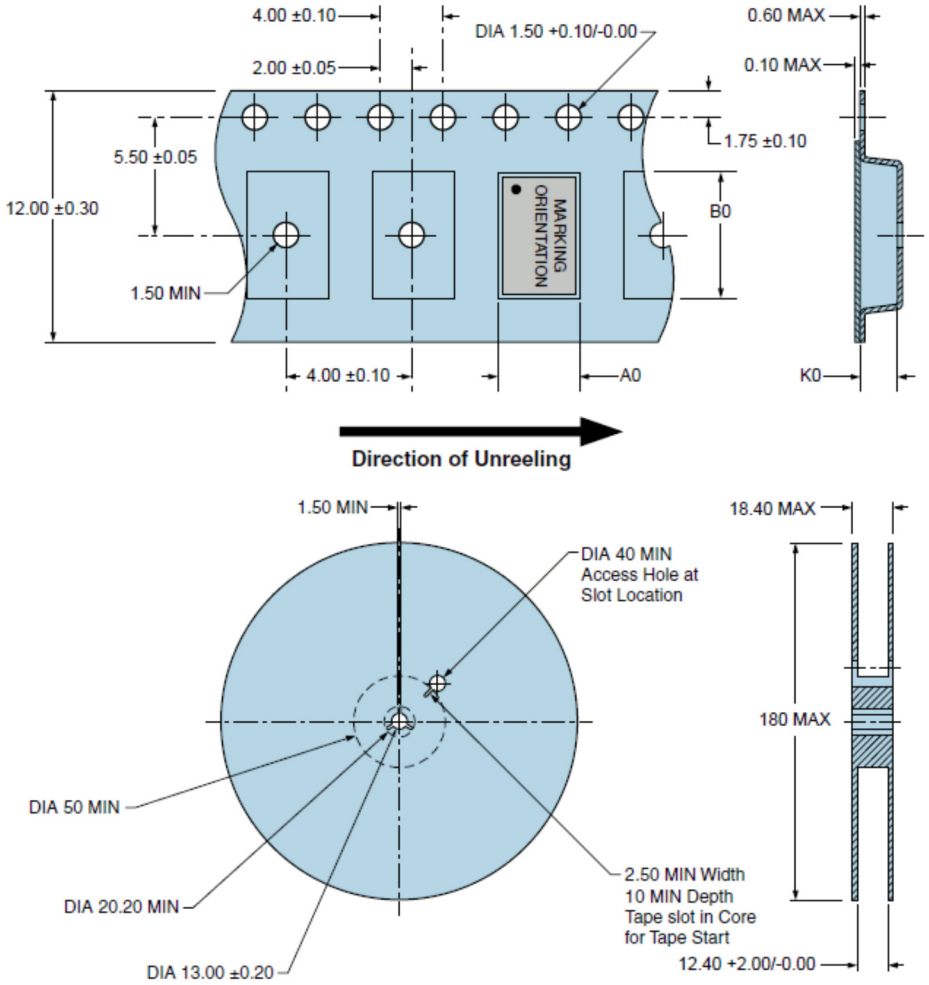
Line 1: **EXXXXXX**
- E = Ecliptek Designator
- XXXXXX = Nominal Frequency in MHz (5 digits + Decimal)

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

Environmental and Mechanical Specifications

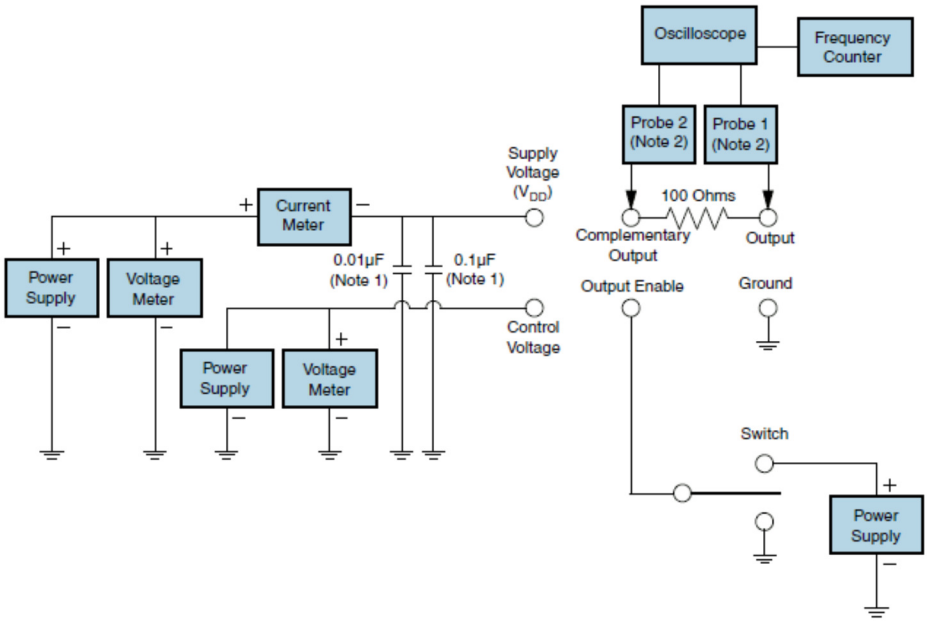
ESD Susceptibility	MIL-STD-883, Method 3015, Class 1, HBM: 1500V
Fine Leak Test	MIL-STD-883, Method 1014, Condition A
Flammability	UL94-V0
Gross Leak Test	MIL-STD-883, Method 1014, Condition C
Mechanical Shock	MIL-STD-883, Method 2002, Condition B
Moisture Resistance	MIL-STD-883, Method 1004
Moisture 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})	45°C/W (degrees Celsius per Watt)
Thermal Resistance (θ_{JC})	19°C/W (degrees Celsius per Watt)

Tape & Reel Dimensions



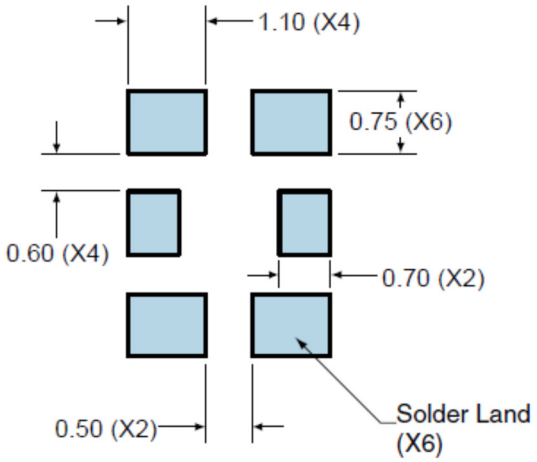
1000 pieces per reel
Compliant to EIA-481
All Dimensions in Millimeters

Test Circuit for LVDS Output



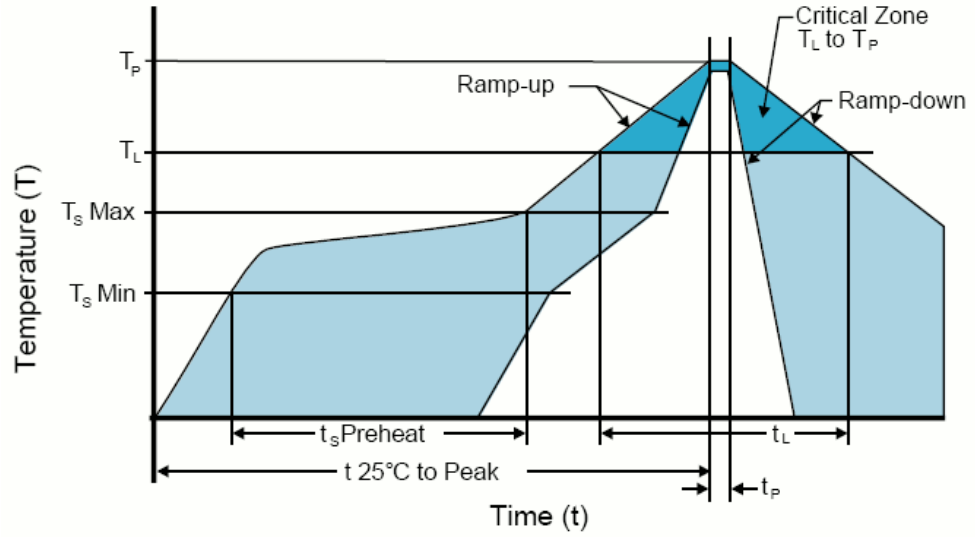
Note 1: An external 0.01µF ceramic bypass capacitor in parallel with a 0.1µF high frequency ceramic bypass capacitor close (less than 2mm) to the package ground and supply voltage pin is required.
Note 2: A low input capacitance (<12pF), 10X attentuation factor, high impedance (>10Mohms), and high bandwidth (>500MHz) passive probe is recommended.
Note 3: Test circuit PCB traces need to be designed for a characteristic line impedance of 50 ohms.

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 shown are applied to body of device.
260°C Maximum for 5 Seconds Maximum, 2 times Maximum.

Low Temperature Manual Soldering

Note: Temperatures shown 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 625):
Some frequencies within this range may not be available

Frequency Stability vs. Frequency Tolerance: ±2.0ppm Maximum

Operating Temperature Range: 0°C to +50°C

Frequency Stability: ±5.0ppm Maximum

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

EQUJ32 E 6 J 1 H -106.250M TR

Series
Temperature Compensated Voltage Controlled Quartz Crystal Clock Oscillators TCVCXO LVDS (DS) 2.5Vdc
6 Pad 2.5mm x 3.2mm Ceramic Surface Mount (SMD)

Frequency Stability vs. Frequency Tolerance
C = ±2.0ppm Maximum
D = ±1.5ppm Maximum
E = ±1.0ppm Maximum

Operating Temperature Range
1 = 0°C to +50°C
2 = -10°C to +60°C
3 = 0°C to +70°C
4 = -20°C to +70°C
5 = -30°C to +60°C
6 = -30°C to +75°C
7 = -30°C to +85°C
8 = -40°C to +85°C

Frequency Stability
D = ±5.0ppm Maximum
E = ±3.0ppm Maximum
F = ±2.5ppm Maximum
G = ±2.0ppm Maximum
H = ±1.5ppm Maximum
J = ±1.0ppm Maximum

Frequency Deviation
1 = ±8ppm Minimum

Output Control Function
H = Output Enable (OE)

Nominal Frequency

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

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