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EQTJ33 Series Oscillator

Temperature Compensated Quartz Crystal Clock Oscillators TCXO LVDS (DS) 3.3Vdc 6 Pad 2.5mm x 3.2mm Ceramic Surface Mount (SMD)



Revision A 09/09/2015

Electrical Specifications

Nominal Frequency	10.000MHz to 625.000MHz <i>Some frequencies within this range may not be available.</i>
Frequency Stability	Inclusive of Operating Temperature Range, at $V_{DD}=3.3V_{DC}$ ± 5.0 ppm Maximum ± 3.0 ppm Maximum ± 2.5 ppm Maximum ± 2.0 ppm Maximum ± 1.5 ppm Maximum ± 1.0 ppm Maximum
Frequency Stability vs. Frequency Tolerance	At 25°C $\pm 2^\circ\text{C}$, at $V_{DD}=3.3V_{DC}$ Pre-Reflow ± 2.0 ppm Maximum ± 1.5 ppm Maximum ± 1.0 ppm Maximum
Frequency Stability vs. Input Voltage	± 0.2 ppm Maximum ($\pm 5\%$)
Frequency Stability vs. Load	± 0.2 ppm Maximum ($\pm 2\text{pF}$)
Frequency Stability vs. Reflow	± 1.0 ppm Maximum (at 25°C, 24 hours after reflow, 1 time)
Frequency Stability vs. Aging	± 1 ppm/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	$3.3V_{DC} \pm 5\%$
Input Current	Unloaded 30mA 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
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) 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
Start Up Time	10mSec Maximum
Storage Temperature Range	-55°C to +125°C

Phase Noise

All Values are Typical

Nominal Frequency: 10MHz to 50MHz

<i>Offset</i>	<i>Phase Noise</i>
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

<i>Offset</i>	<i>Phase Noise</i>
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

<i>Offset</i>	<i>Phase Noise</i>
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

<i>Offset</i>	<i>Phase Noise</i>
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

<i>Offset</i>	<i>Phase Noise</i>
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

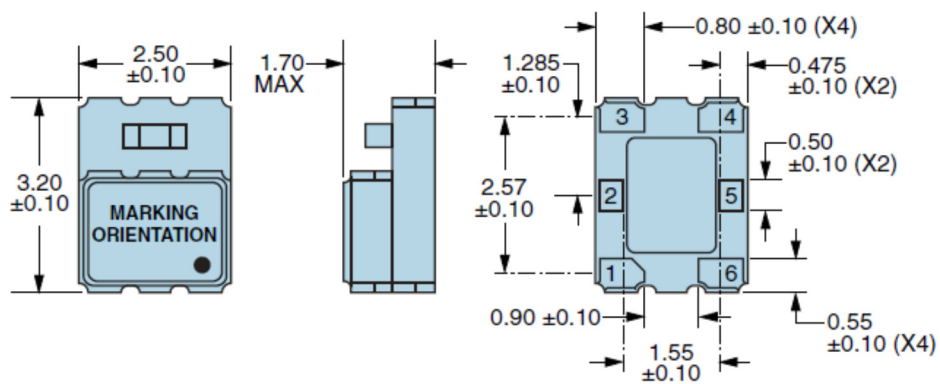
<i>Offset</i>	<i>Phase Noise</i>
10Hz	-54dBc/Hz
100Hz	-84dBc/Hz
1kHz	-97dBc/Hz
10kHz	-104dBc/Hz
100kHz	-105dBc/Hz
1MHz	-124dBc/Hz
10MHz	-134dBc/Hz
20MHz	-136dBc/Hz

RMS Phase Jitter

Fj=12kHz to 20MHz (Random)

<i>Nominal Frequency Range</i>	<i>RMS Phase Jitter</i>
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 1.0 μ m) over Nickel (1.27 to 8.89 μ m).

All Dimensions in Millimeters

Pin 1: Do Not Connect

Pin 2: Output Enable (OE)

Pin 3: Case/Ground

Pin 4: Output

Pin 5: Complementary Output

Pin 6: Supply Voltage

Marking Specifications

Line 1:

XXXXXX

- E = Ecliptek Designator
- XXXXXX = Nominal Frequency in MHz (5 digits + Decimal)

Line 2:

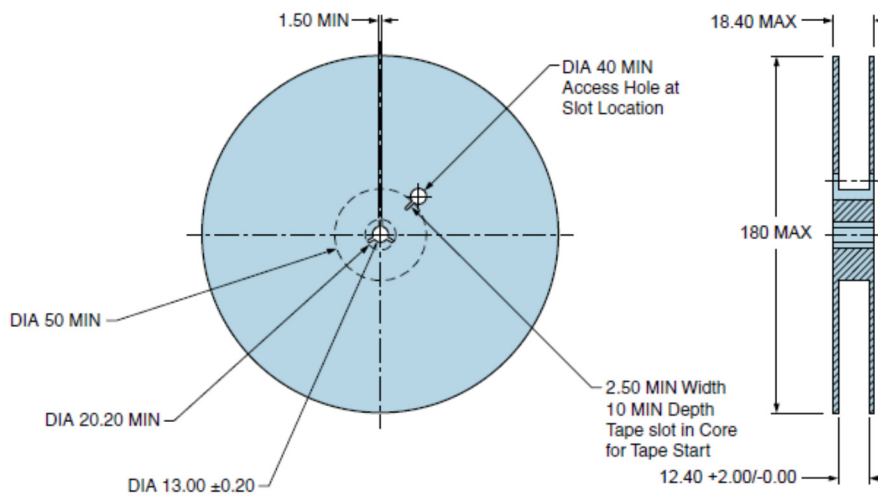
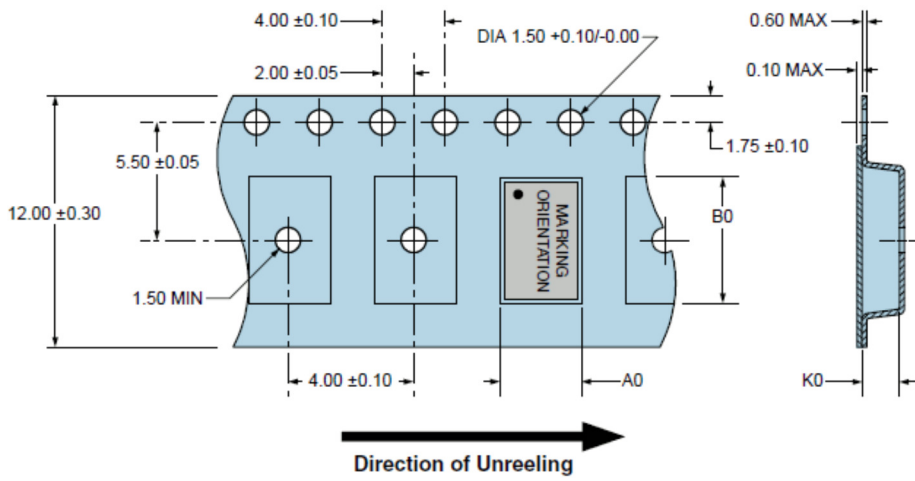
XXXXX

- XXXXX = Ecliptek Manufacturing Identifier

Environmental and Mechanical Specifications

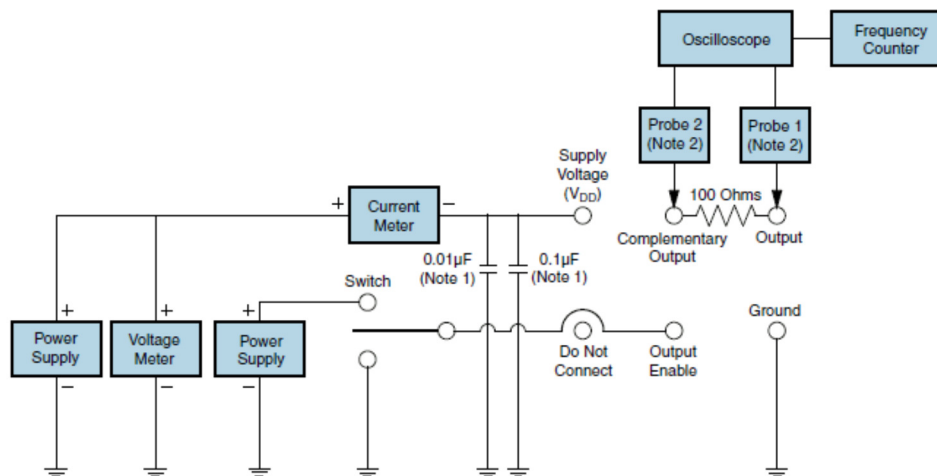
ESD Susceptibility	MIL-STD-883, Method 3015, Class 1, HBM: 1500V
Fine Leak Test	MIL-STD-883, Method 1014, Condition A
Flammability	UL94-V0
Gross Leak Test	MIL-STD-883, Method 1014, Condition C
Mechanical Shock	MIL-STD-883, Method 2002, Condition B
Moisture Resistance	MIL-STD-883, Method 1004
Moisture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

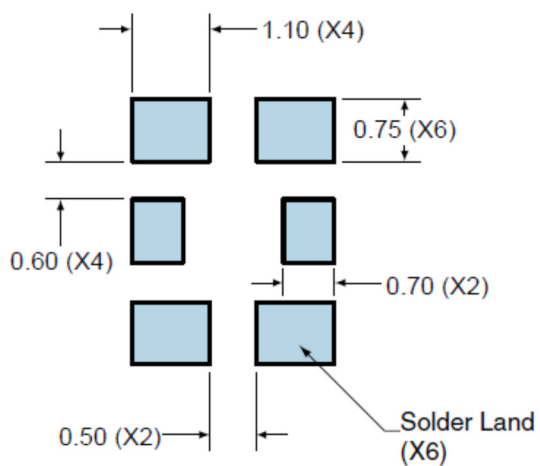


Note 1: An external $0.01\mu\text{F}$ ceramic bypass capacitor in parallel with a $0.1\mu\text{F}$ high frequency ceramic bypass capacitor close (less than 2mm) to the package ground and supply voltage pin is required.

Note 2: A low input capacitance ($<12\text{pF}$), 10X attenuation factor, high impedance ($>10\text{Mohms}$), and high bandwidth ($>500\text{MHz}$) passive probe is recommended.

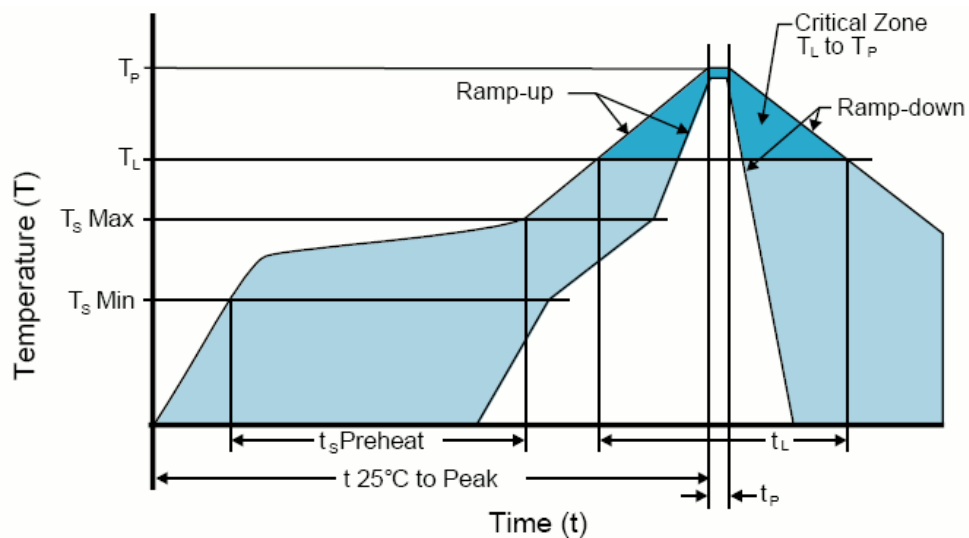
Note 3: Test circuit PCB traces need to be designed for a characteristic line impedance of 50 ohms.

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:

Operating Temperature Range:


Frequency Stability:


Packaging Options:

 Next

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Access these Part Number specific resources and tools


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Part Numbering Guide

EQTJ33 Series Oscillator Part Numbering Guide



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