Frequently Asked Questions

Rev A

For Series:	E2S

1. What is a quartz crystal?

An electronic component, consisting of a resonator plate with electrodes and a hermetically sealed package with suitable mounting structures, used in frequency control applications. Synthetic quartz crystals are hexagonal mono-crystals composed of Silicon and Oxygen (SiO_2) and are cultured in autoclaves under high pressure and temperature. Quartz crystals exhibit piezoelectric properties and can be used to stabilize the frequency of an oscillator circuit. Utilizing a proprietary crystal resonator design and exclusive processing techniques, this series of crystals is calibrated to a specified nominal frequency prior to shipment to the customer.

2. What are the typical customer circuit applications for this product series?

This crystal series can be used in any of the following applications:

- Phase-Locked Loop and Frequency Synthesis
- Synthesizer or System Reference
- Clock Distribution

3. What are the typical applications and end item products for this product series?

Here is a list of the common applications and products:

- Routers, Servers, Hubs, and Network Switches
- High Resolution Video, and Set-top Boxes
- Scanners, Printers, Modems
- LCD Displays and HDTV
- Interface Controllers
- Medical Equipment
- PDAs and Portable Media Players
- Digital Cameras and Gaming Products
- Notebook Computers
- Video Cameras and Video Recorders
- Portable Devices
- Computer Peripherals and Networking Products

4. What technical benefits does this product series offer?

This crystal series offers:

- Improved frequency stability through the use of a bulk acoustic wave (BAW) quartz crystal resonator
- AT and BT crystal cuts
- Fundamental or third overtone modes
- Parallel or series resonance operation

- Industry standard moisture sensitivity level 1 (MSL1) rated package
- RoHS Compliant (Pb-free) with high temperature 260°C reflow capability

5. What is the nominal frequency range for this product series?

The nominal frequency is the specified reference or center frequency of the crystal, expressed in megahertz (MHz). This frequency is the desired frequency for which the crystal is designed and manufactured. The nominal frequency range can be found on the datasheet.

6. What are the frequency tolerance options for this product series?

The frequency tolerance is the amount of frequency deviation from the specified nominal frequency at room temperature (25°C). This term is expressed as a minimum and maximum percent (%) or parts per million (ppm). The available frequency tolerance options can be found on the datasheet.

7. What are the frequency stability options for this product series?

The frequency stability is the amount of frequency deviation from the ambient temperature frequency over the specified operating temperature range. This term is expressed as a minimum and maximum percent (%) or parts per million (ppm). The available frequency stability options can be found on the datasheet.

8. What are the operating temperature range options for this product series?

The operating temperature range is the minimum and maximum temperatures that a device can be exposed to during oscillation. Over this temperature range, all device specified operating parameters are guaranteed. The available operating temperature range options can be found on the datasheet.

9. What is the storage temperature range for this product series?

Storage temperature range is the minimum and maximum temperatures that the device can be stored or exposed to when in a non-oscillation state. After exposing or storing the device at any temperature over this range, all of the specifications are guaranteed over the operating temperature range. Exceeding the storage temperature range may result in device failure or internal component damage. The storage temperature range can be found on the datasheet.

10. What are the mode of operation options for this product series?

A quartz crystal is designed to vibrate either on its fundamental mode or one of its overtone modes. For AT cut and BT cut quartz crystals, overtone modes are at odd frequency harmonics. The mode of operation options can be found on the datasheet.

11. What are the crystal cut options for this product series?

The crystal blank plate is cut with respect to the crystallographic axis of a quartz bar. The type of crystal cut (AT or BT) influences the crystal's aging, frequency stability, and other parameters. The crystal cut options can be found on the datasheet.

12. What are the load capacitance options for this product series?

The load capacitance, specified in picofarads (pF), is the amount of capacitance presented to the crystal. The parallel load resonant frequency (F_L) is a function of the load capacitance. If no capacitance is presented to the crystal, the crystal is termed series resonant and no load capacitance is specified. The series resonant and load capacitance options can be found on the datasheet.

13. What are the equivalent series resistance (ESR) specifications for this product series?

ESR is the resistive element, measured in ohms as a maximum value, of a crystal device. The ESR specifications can be found on the datasheet.

14. What is the shunt capacitance specification for this product series?

Shunt capacitance is the static capacitance between the crystal terminals. Measured in picofarads (pF) and specified as a maximum value, the shunt capacitance specification can be found on the datasheet.

15. What is the spurious mode specification of this product series?

A spurious mode is an unwanted non-harmonic signal found in the frequency response of a quartz crystal, occurring at some point higher than the desired mode but lower than the next overtone. The spurious mode specification can be found on the datasheet.

16. What is the drive level specification for this product series?

Drive level is a function of the driving or excitation current flowing through the crystal and is the amount of power dissipation in the crystal, expressed in microwatts or milliwatts as a maximum value. The drive level specification can be found on the datasheet.

17. What is the aging specification for this product series?

Crystal aging is the systematic change in frequency with time due to internal changes in the quartz crystal resonator. Aging is often expressed as a maximum value in parts per million per year (ppm/year). The crystal aging specification can be found on the datasheet.

18. What are the construction characteristics of this product series?

This product series consists of a fundamental or third overtone mode BAW quartz crystal packaged inside a hermetically sealed resistance welded metal can SMD package.

19. What is the insulation resistance specification for this product series?

The insulation resistance is the minimum value in ohms, between the leads of the crystal and between the crystal leads and the base. The insulation resistance specification for this product series can be found on the datasheet.

20. Is this product series compatible with my existing assembly process equipment?

If the part number is specified with the TR packaging option, crystal products are delivered to the customer in EIA481 compliant tape and reel packaging. Without the TR option, products are delivered to the customer in bulk packaging as specified on the datasheet.

21. Is this product series compatible with my existing reflow processes?

This product series is capable of withstanding industry standard high temperature (260°C, 10 seconds) convection reflow processes and is rated MSL1 per J-STD-020. The suggested solder reflow diagram is provided on the datasheet.

22. Is this product series RoHS compliant and Pb-free?

This product is RoHS compliant and Pb-free as defined in the Ecliptek RoHS Compliant (Pb-free) Roadmap.

23. How can I obtain a RoHS compliant (Pb-free) certification for this product series?

A RoHS and Pb-free product certification letter can be obtained directly from our website by using the Ecliptek RoHS/Pb-Free Certification Letter Generator.

24. Is an IPC-1752 material declaration available for customer review?

Ecliptek can provide a Material Declaration in compliance with IPC-1752 to assist customers with their material compliance requirements.

25. How do I layout my printed circuit board for this product series?

A suggested solder pad layout is provided on the datasheet.

26. Who do I contact if I have additional technical questions about the use of this product series?

The Global Customer Support team at Ecliptek can provide applications engineering support or answer customer technical questions.

27. How do I order a crystal that has custom requirements not specified on the crystal series specification sheet?

Please contact the Ecliptek Global Customer Support team for additional support or questions regarding your crystal requirements.

28. What are the environmental and mechanical specifications for this product series?

The environmental and mechanical specifications for this product series are listed on the datasheet.

29. What reliability information is available for this product series?

Failure in Time (FIT) and Mean Time to Failure (MTTF) reliability data is available for this product series within the product series Qualification and Reliability Report found on the series home page.

30. What is the marking scheme for this product series?

This series of product has marking content on the top of the part. The datasheet provides the marking content.

31. Can I identify the Ecliptek part number or specification based upon the markings on top of the part?

In order to protect our customer's intellectual property, the Ecliptek part marking does not identify the Ecliptek part number or specifications.

32. Where can I get the information regarding discontinued or End of Life (EOL) products?

Any Ecliptek part number currently under an End of Life statement will be identified as EOL on an Ecliptek quotation, along with a link to the EOL statement. This information can also be found on the End of Life Statements for Discontinued and Obsolete Products section of our website.

33. Is Ecliptek ISO 9000 Certified?

Yes, Ecliptek is certified to ISO 9001.

34. How can I obtain a REACH compliance statement for this product series?

A Registration, Evaluation, Authorization, and Restriction of Chemicals (REACH) compliance statement can be obtained directly from our website by using the Ecliptek REACH Compliance Resources page of our website.