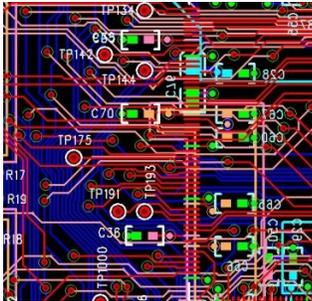
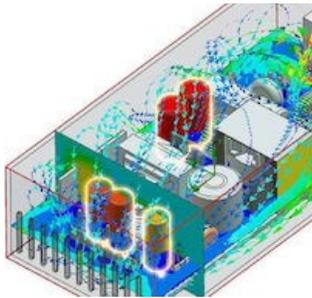


Electronic Product Design Review for Power Quality Performance

What Have You Included in Product Design to Deal with PQ & EMC?



Electrotek's PCB analysis can identify traces issues causing PCBs to fail during surge testing.



Review of thermal imaging analyses can reveal component issues when some steady-state PQ disturbances occur.

Product designers are eager to complete their circuit designs to avoid market delays. Marketing departments apply pressure to ensure products are introduced to the market on time. Circuit designers are focused on producing a design to meet market requirements. Products must be compliance tested to IEEE, IEC and UL standards prior to market entry. Electrical standards promulgated by these agencies deals with electromagnetic compatibility (EMC). Official compliance testing is expensive, time-consuming and must follow laboratory schedules and often requires repeating when failures occur. When failures occur, designers must determine why, and resolve the issues.

Repeating tests further delays market entry.

Expert PQ engineers at Electrotek can conduct a design review of products to pre-determine prior to the first round of compliance testing if the designed has properly addressed PQ emissions and immunity performance. Electrotek's review of the product will identify shortcomings of the design that can delay official compliance testing, and even identify marginal PQ performance that could result in a product recall.

Three decades of pre-compliance testing and forensic analysis of electronic products can be used to help designers avoid potential delays in completing their designs. Electrotek's proprie-

tary *Design Review Procedure for Effective Power Quality and Electromagnetic Compatibility Performance*, always identifies at least **three** issues that must be corrected before the designer submits the design package for pre-compliance or official compliance certification.

Each electrical test listed in IEEE, IEC and UL test methods is related to power quality and EMC performance. Our design review procedure is written to identify specific design features that can cause products to fail any of the tests in these standards. A design review at Electrotek will save the manufacturer time and money prior to market entry—guaranteed.

Participating in an Electrotek PQ/EMC Product Design Review is Easy!

Participation in an Electrotek PQ/EMC product design review is easy! First, submit a request for participation in our program to ProductPQ@electrotek.com with your Non-Disclosure Agreement (NDA). If you don't have an NDA, Electrotek will provide ours to

you for review. After the NDA is in place, each manufacturer must submit the following to receive a proposal/quote:

- Theory of operation (if available)
- Product datasheet
- Schematics

- Bill of Materials (BOM)
 - Internal test reports
- Electrotek will review these materials, and develop a proposal including a schedule and list of deliverables.

The technical report will provide a list of design improvements including a detailed discussion of why

the improvements are necessary, how the improvements should be carried out, and the expected improvement in PQ and EMC performance. Modeling and simulation of the deficiencies identified as well as the improvements can be demonstrated.

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Electrotek's Power Quality Engineering Services Center is a world-renowned center for power systems and power quality engineering. Our Center includes an Advanced Power Quality Testing & Research Laboratory.

Learn about our Center by visiting: www.pqengineering.com

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Benefits of Engaging in an Electrotek PQ/EMC Design Review

Every experienced product designer has endured design deficiencies and failures that could have been avoided if PQ and EMC were addressed very early on during the design process. Below are some benefits of engaging Electrotek in a PQ/EMC design review.

- The smallest of details in a product design can cause a sudden failure when a PQ disturbance occurs. A PQ/EMC design review will identify those details.
- Early identification of PQ- and EMC-related design deficiencies will significantly impact the failure rate and warranty cost.
- Identification of design deficiencies will help ensure a shorter pre-compliance and official compliance test cycle.
- A design review may also identify major design issues related to component size and rating as well as spacing issues.
- A design review includes an analysis of the grounding performance of the printed circuit board regarding low- and high-frequency PQ disturbances as well as high-frequency EMC immunity tests for radiated and conducted disturbances.
- Many PQ-related design improvements also improve the EMC emissions and immunity performance; thus lowering the overall product development costs and schedule.

About Electrotek

Founded in 1984, Electrotek Concepts, Inc. is world renowned for its research, developmental, applications, and problem-solving work in understanding, identifying, analyzing, and preventing power quality (PQ) problems. Our expertise extends from the utility generators, to the electrical/electronic load inside a customers' facility. The experience of Electrotek's team of PQ engineers extends from experts in utility power systems, participants on IEEE and IEC standards boards regarding PQ standards, to designers of end-use electronic equipment. Our engineers are armed to address any PQ problem at any level. The future of reliable, available power, and customer equipment in today's modern technological society depends on compatibility between utility power, the customer's facility electrical system, and the end-use equipment customers depend on to carry out their day-to-day business activities.

