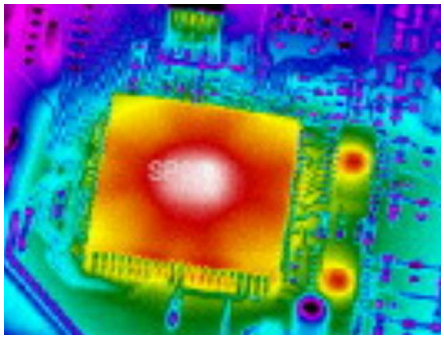
Exponent®
Engineering and Scientific Consulting

Electrical & Thermal Performance

Overview



Electronic devices are getting smaller while their power requirements are increasing. Proper design of electrical and thermal management within the devices are therefore becoming increasingly critical to sustain performance and reliability.

Exponent has the experience and capability of monitoring and modeling the performance of various components in real time under various conditions. This includes determining thermal hot spots and the temperature rise and distribution analysis and modeling inside battery packs, power supplies, chargers, and host devices. Our staff has the experience and capability to perform a wide range of tests on devices to evaluate the electrical and thermal management systems performance under predetermined thermal, electrical and environmental stress conditions.

The following is an overview of a subset of equipment available for testing and failure analysis located in our laboratories:

Electrical

- Power supplies
- High speed data loggers – voltage
- High speed data loggers – current
- High speed data loggers – temperature
- Cell cyclers
- Electronic loads
- AC power meters
- Multimeters
- IR camera

Thermal

- Thermal chambers
- Temperature chambers
- Fume hood
- Automated cell vent tester

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Mechanical/Materials

- Microscopes
- Shock tester
- Vibration tester
- High resolution cameras
- Video cameras

The equipment and facilities allows testing to be performed seamlessly. A list of sample tests that we rountinely perform include:

- IR thermography
- Thermal characterization
- Thermal performance testing
- Electrical characterization testing
- Electrical performance testing
- Battery design review and testing
- CTIA battery testing
- UN cell and battery testing
- Mechanical testing
- Environmental testing
- Customized testing
- Combustion testing
- Small explosion testing

Test information is a key component in analyzing test performance. Exponent has experience evaluating and testing a wide range of products. Our laboratories are equipped with high-speed data loggers and video cameras. Our engineers and technicians are trained and experienced to perform both standardized as well as non-standardized tests. This capability and our wide expertise and experience in new product designs provides us the knowledge tools to evaluate products and develop credible design of experiments to analyze a failure or design.

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