Case Study

Laser Diode Burn-in & Reliability Testing with Samtec HSEC8 Interface

Electron Test Equipment

Application:	Packaged laser diode reliability testing for high-speed supercomputing communication device.
Solution:	Custom ATE laser test system & Custom DUT (Device Under Test) with Samtec HSEC8 Interface

Overview

This project required a custom ATE laser diode testing system for 16 lasers to be tested for reliability and performance at the development stage for up to 200 mA laser diodes.

Challenges

Problem: There was no readily available automated test equipment for burn-in and reliability testing of a high-speed laser diode with Edge Card System Samtec HSEC8 interface connection.

Testing Requirements: Testing the laser with monitor (photodetector) for performance from 4mA to 200 mA at elevated temperatures of 75 degrees C.

Other Constraints: The custom DUT (Device Under Test) board interface was designed to accommodate a custom Samtec HSEC8 Interface to maintain 75 degrees C.

Approach

Equipment Used: Electron's custom ATE system was selected as a backbone of the design to ensure the accuracy and data consistency needed for this project. In this application, the measuring range was chosen from 4 mA to 200 mA at elevated temperatures of 75 degrees C.

Testing Protocol: The system was designed to be flexible with its user interface to adapt to various test procedures. These include varying light intensities and temperatures to assess performance. In this case, the testing temperature was up to 75 degrees C.

Analysis Techniques: The system provided a GUI display and data logging of the following information:

- FIT (Failure in Time) & Mean Time to Failure (MTTF) calculation
- Operating Current
- Monitoring current data collection
- L-I-V tests and data collection

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Outcomes

Performance Metrics: The customer expressed high satisfaction with the exceptional performance of our custom-designed ATE laser diode test system. The system's precision and efficiency were key in addressing their specific testing needs. By enabling the simultaneous analysis of 16 laser diodes, it streamlined the testing process significantly, reducing the time and resources required for comprehensive evaluation.

Insights: The success of this initial project has firmly established Electron Test Equipment as a trusted and strategic partner for the customer’s ongoing and future endeavors.

By delivering a high-performance, custom-built solution that exceeded expectations, the project not only met immediate objectives but also demonstrated our ability to provide innovative and scalable testing systems.

Conclusion

The exceptional performance of our laser diode reliability test system, which facilitated the analysis of 16 laser diodes to align with design requirements, has greatly impressed the customer. This success has firmly established Electron Test Equipment as a trusted partner for the project's upcoming expansion.

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