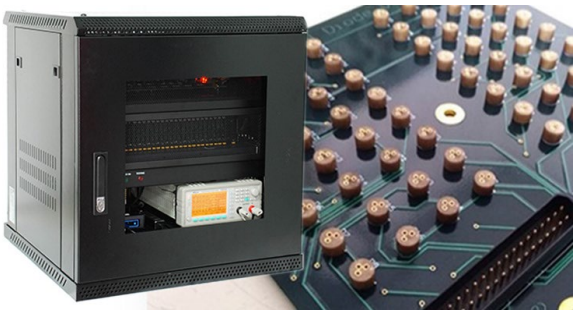
Case Study

Laser Diode Burn-in & Reliability Testing for Telecommunication Industry

Electron Test Equipment

Application:	Multi-laser diode TO-56 package burr in & reliability testing for the telecommunication industry.
Solution:	Custom ATE laser testing solution



Overview

This project required 256 lasers to be tested for reliability and performance at the development stage for up to 200 mA laser diodes for telecommunication devices. There were 4 laser diode reliability test stations built.

Challenges

Problem: The absence of specialized automated test & measurement equipment capable of testing small production batches of laser diodes operating at up to 200 mA for telecommunications posed a significant challenge.

Testing Requirements: Testing the laser with monitor 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 TO-56 laser packages with a heatsink 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 256 laser diodes, it streamlined the testing process significantly, reducing the time and resources required for comprehensive evaluation.

The advanced reliability testing capabilities of the system ensured that each diode was thoroughly assessed against the stringent design criteria, providing the team with detailed insights into performance metrics.

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 successful performance of our laser diode reliability test system, which facilitated the analysis of 256 laser diodes to meet stringent design criteria, has earned high praise from the customer. This achievement highlighted the system's precision and efficiency, demonstrating its ability to address complex testing requirements effectively.

As a result, Electron Test Equipment has solidified its position as a key supplier, paving the way for deeper collaboration as the project scales to meet increasing demands.

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