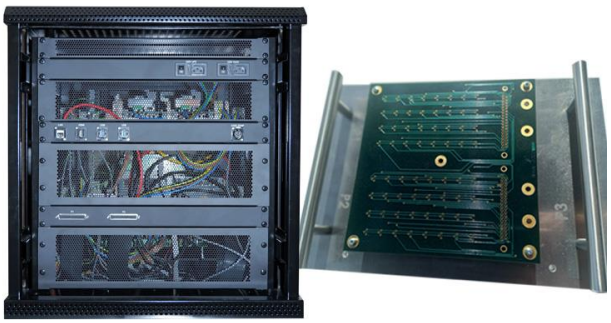
Case Study

Photodiode Burn-in & Reliability Testing for Gravitational Measurement Instruments

Electron Test Equipment

Application: Advanced scientific research and technology development-related to gravitational measurement instruments.

Solution: Custom ATE Photodiode Burn-in & Reliability Test System, Custom DUT (Device Under Test) Board, combined with Environmental Test Chamber



Overview

The customer needed to test their next-generation photodiodes for burn-in and reliability to ensure they could consistently deliver the precision required for applications like gravitational wave detection, gravitational redshift measurement, and gravity gradiometry.

This project required a photodiode reliability testing system to qualify their next-generation photodiode components capable of maintaining performance under the demanding conditions of gravity measurement.

Challenges

Problem: No equipment was available to test the photodetector for dark current performance under elevated temperature conditions.

Testing Requirements: Testing dark current conditions under elevated temperature for up to 64 components. In addition, the photodiode interface was designed to test up to 64 components from various photodiode designs to select the best performing component.

Other Constraints: The customer faced a tight 3-month deadline to begin testing with the customized ATE photodiode reliability test equipment.

Approach

Equipment Used: A custom-engineered system was selected as the backbone of the design to ensure the accuracy and data consistency needed for this project.

This application chose the measuring range from 100 nA to 32,000 nA.

Testing Protocol: The system's user interface is flexible, allowing it to adapt to various test procedures. These include varying light intensities and temperatures to assess performance.

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
- Dark Current
- I-V tests and data collection

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Outcomes

Performance Metrics:

The customer expressed great satisfaction with our customer service, emphasizing our responsiveness, attention to detail, and commitment to meeting their unique needs.

They appreciated the seamless collaboration during the development process, the intuitive and user-friendly software, and the system's outstanding performance in addressing the stringent requirements of gravity measurement applications.

The customized photodiode reliability test system enabled the team to thoroughly analyze the performance and durability of various photodiodes under conditions simulating the precise requirements of gravity testing.

Insights: The success of this initial project established Electron Test Equipment as a trusted partner, positioning the company as the primary supplier for the project's expansion. This achievement underscores the reliability of our solutions and the value of our collaborative approach in meeting the customer's advanced testing needs.

Conclusion

The successful delivery of the customized photodiode reliability test system not only met the customer's stringent requirements for gravity measurement applications but also exceeded expectations in performance, ease of use, and support.

This collaboration has solidified Electron Test Equipment's reputation as a reliable partner, paving the way for continued involvement in expanding the customer’s ambitious projects in advanced gravity testing technologies.

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