

Electron Test Equipment Case Study

Ensuring Photodiode Reliability for Low Cost
QSFP28 Optical Transceiver with Automated Test Equipment (ATE)

Customer:	Semiconductor Manufacturer
Location:	North America & Asia
Solution:	Provide Automated Test Equipment to Confirm Photodiode Reliability

What We Do

Electron Test Equipment Inc. manufactures custom made Automated Test Equipment (ATE) for companies who require product reliability and burn-in testing for semiconductors; lasers, photodiodes, ICs used in telecom, aerospace, and military applications.



Background

Our customer is a manufacturer of photodiodes and lasers for telecommunication applications. They have developed a next generation low cost and high-speed photodiode for QSFP (Quad Small Form-Factor Pluggable) transceivers.

The 100GB QSFP28 can operate for short and long-range use and will drastically reduce the cost of QSFP manufacturing.

Challenge

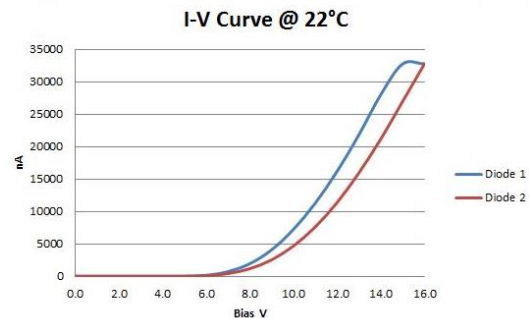
- Limited budget for ATE
- Rapid delivery of tested photodiode component to their customer was critical
- Ensure that the new photodiode will meet or exceed Telcordia GR-468 standard prior to mass production.
- Require statistical model to give the most accurate estimate of failure rate in the field application through accelerated life testing
- Reliability data need to be provided to C-level executive team and customers

Solution

1. The custom made ATE was designed to meet the customer's budget and test requirements for 256 channels.

2. To meet our customer's deadline for component delivery, the **ATE lead time was 8 weeks** including software customization.

3. The ATE was designed to meet Telcordia GR-468 standard. This included testing of bias current, I-V sweep test, and FIT test. The interface was customized for easy operation. Notification of test results such as random failure was sent to key personnel through e-mail & SMS.



4. An I-V test at 22° C was performed to test breakdown voltage of the diodes. In this case, the breakdown voltage was occurring at 15V. However, the device was designed to operate around 3V and passed the qualification test.

The 256 photo-diodes were ready for testing at elevated temperature of 175 ° C to monitor the dark current (FIT) and I-V testing for 4000 hours.