

FOCUS DIODE TESTER

INDUSTRY / SITE

Semiconductor / Flexible Circuits

Midwest Region—Minnesota

PROJECT / APPLICATION

Design verification and production tester for the characterization of diodes on printed circuit board assemblies.

EXISTING SITUATION

Our customer was having problems testing their diode product line. The time required for executing production tests was beyond acceptable levels given the relative demand for this particular product. ProMetric was asked to design and implement a new test methodology that would result in a reduction in test time as well as provide characterization data for each component.

KEY ISSUES

- Test time is very important for production verification
- A self-test would be very useful for validating switch and PLC integrity
- The system should be easy to operate and maintain
- Test data should be both reliable and accessible
- The system should test for shorts, opens, forward bias voltage, and reverse bias voltage
- The system will interface with the production PLC to ensure the DUT is in place prior to test execution
- The system should allow the operator to identify a failed part quickly



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SOLUTION

ProMetric engineers designed the system with a focus on the reduction of test time. In the past, mechanical relays were used to switch between each DUT; however, in this system, a 136x4 FET switch matrix was used in conjunction with a four quadrant source measure unit (SMU). This allowed forward and reverse bias voltage tests to be conducted with the SMU as opposed to switching leads on each individual DUT. The system was also capable of conducting a shorts and opens test very quickly as settling times were significantly less due to the characteristics of the FET switch matrix.

RESULTS / SAVINGS

The return on investment for this solution was realized as soon as the system was deployed. Our customer was able to capture savings associated with production due to the significant reduction in overall test time on each diode. In addition, the number of maintenance and troubleshooting issues declined due to the integrated self-test, which ensured switch and PLC integrity. The engineers also received characterization data for each failed DUT which helped improve their inspection process.

SYSTEM HIGHLIGHTS

- NI LabVIEW - Test Software
- National Instruments PXI System w/ MXI-4 Interface
- Modular Instrumentation including FET Switch Matrix, Source-Measure Unit, and Multi-function DAQ Module
- Interface to Allen Bradley PLC
- Fixture Requirements to connect all 88 DUTs at the same time
- Deployed Windows-based PC to capture test information and reports for engineering staff

