

Optoelectronics

Introduction

From telecommunications to military targeting devices, optoelectronics have revolutionized the speed and methods in which data is transmitted. The revolution that makes this possible is driven by the efficiencies of semiconductor production, test and packaging. Individual components may be small and inexpensive; however their function and reliability are key to maintaining the data management systems they are a part of. SemiProbe has played a role in the development of key new test technologies that have allowed our customers to improve reliability, have full confidence in test results, and cut time to data. Each of these allows our customers to reduce their cost of test. This is a short summary of some of the SemiProbe solutions:

- Probing & Inspection Systems
 - Single & Double Sided
 - Systems or Integrated Solutions
- R&D to Production
- Manual, Semiautomatic & Fully Automatic Systems
 - Die, Wafers, Partial Wafers, Frames, Substrates
 - 50 mm to 300 mm



LED Test

One common component for successful LED test is that it has to be fast, accurate and easily configurable to meet the specific test requirements of the devices being tested. Because of the sheer number of devices requiring test, the system must be high speed. The SemiProbe small wafer semiautomatic system used for LED test can be field upgraded to fully automatic.

Vertical Cavity Surface Emitting Laser Test (VCSEL)

The advantage VCSEL testing is that they can be tested at wafer level using conventional probing systems with the adaptation of an integrating sphere capable of being accurately positioned over the Device Under Test (DUT) after probe alignment. SemiProbe has 3 solutions to meet the changing needs of our customers. One allows the integrating sphere to be mounted on a compound microscope, another on a StereoZoom and a third that allows both VCSEL and EELD test to be accomplished on the same system.

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Types of Optoelectronic Devices Tested

- ❖ Light Emitting Diodes (LEDS)
 - High Brightness
- ❖ Vertical Cavity Surface Emitting Laser Diodes (VCSELS)
- ❖ Edge Emitting Laser Diodes (EELD)
- ❖ Photodiodes
- ❖ Small Signal
- ❖ Photovoltaics/Solar Cells



*Let us help you with your
OPTOELECTRONIC testing or inspection
requirements*

(802) 860-7000

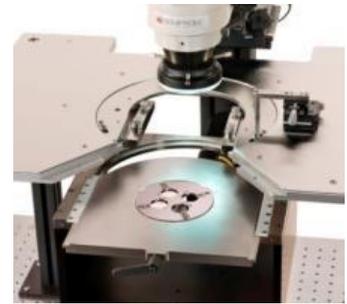
Edge Emitting Laser Diode Test (EELD)

EELD testing is normally accomplished in a “bar” configuration with each bar being a row of laser devices that emit out of the side edges of the device. In some cases, it is desirable to measure the output from both sides of the device simultaneously. For high speed EELD test, a pick and place system removes the bars from their packs and places them on a specially designed thermal chuck. This chuck holds the small bars with vacuum and provides precision temperature control. These bars may be tested at multiple temperature settings. Once testing is complete, the bars are removed by the pick and place system and put into packs according to the predetermined “bins” established for various test criteria.



Double Sided Applications (DSP)

Some devices require exposure or light collection from one side while probes for stimulation or measurement are landed on the other. Our Double Sided Probing (DSP) solutions allow the mounting and positioning of these light collection or stimulation systems on one side while probes are landed on the other. Individual devices (as shown in the photo to the right) may be tested as well as partial wafers and whole wafers. Systems are available in manual or semiautomatic configurations.



Research



Optoelectronics researchers are often faced with unique setups for light collection, stimulation or measurement. Our modular Probe System for Life (PS4L) platform allows us to provide custom made solutions to meet the researchers need at a reasonable cost and in the same delivery time as standard systems. Shown here is a semiautomatic DSP system with DC stimulation on one side and optical detection on the backside using a unique temperature system and device fixturing system. It was a turn-key system that included the prober, thermal system, test instrumentation and Graphical User Interface (GUI).

Sensors

Infrared (IR) and Ultra Violet (UV) sensors are finding uses in all aspects of our daily lives. Many of these detectors are eventually placed in a vacuum package. This may be wafer level packaging or conventional vacuum packages. Because both vacuum packages are expensive, making sure that all devices are working properly (KGD) prior to packaging is important. Our semiautomatic and fully automatic vacuum probing systems allow the user to verify device functionality and determine the minimum vacuum level for proper device operation.



Photovoltaics/Solar Cells



Test and evaluation of individual solar cells prior to their insertion into the final solar panel is imperative to avoid costly rework. SemiProbe provides manual and semiautomatic systems for solar cells on a variety of substrates and construction methods. We work with a number of solar cell simulator companies to provide integrated solutions with their test instrumentation.



Optical Wafer Inspection

Many optoelectronic devices require inspection to find visual rejects such as missing probe marks, contamination, cracks, saw errors, etc. Our Wafer Inspection System (WIS) provides a powerful solution that can lower your costs and cut time to market.

- Manual, Semiautomatic and Automatic Systems

Automation

Recent trends in optoelectronic wafer level testing is the integration of multi-axis (3 and 6) programmable manipulators to automate and optimize the light collection and testing. Typical configurations include DC, HF and optical probes in a variety of configurations using semiautomatic and fully automatic probe systems.



From Research to Production, SemiProbe provides cost effective solutions with systems that upgrade and grow with your requirements.