



Lloyd Doyle Introduces new Bump Inspection System Using Emerging Technology

Lloyd Doyle Limited is a world leader in the supply of Automatic Optical Test (AOT) and inspection systems. These AOT systems provide the most cost effective way of finding defects on printed circuit board (PCB) images, thus increasing manufacturing yields and improving profitability.

While a full choice of systems for all applications is offered from large format optical test to microvia hole inspection in addition to all types of inner layer and outer layer optical test, Lloyd Doyle's newest development for solder bump inspection is the *IBIS* system.

IBIS, the Interferometric Bump Inspection System, uses emerging technology to offer production volume solder bump inspection on chip carriers. It is designed to inspect and report on the position, height and shape of solder bumps on the die-attach side of chip carriers, ensuring that the carriers are within specification for chip attachment.

The system is designed to inspect coined and non-coined solder bumps on chip carrier die attach regions. It is capable of scanning 3,000 devices per hour and reporting on solder bump height, volume, circularity and co-planarity.

IBIS uses massively parallel digital signal processing technology coupled with true white light interferometry to offer 20 to 30 times improvement over existing interferometry systems previously available. Lloyd Doyle's proprietary enhancements give *IBIS* the edge for solder bump height measurement. This enabling technology will be transportable to wafer and chip solder bump measurement in the future.

"This system represents a breakthrough in inspecting and measuring bump parameters accurately at high speed," said Roy Lloyd, CEO. "It will enable manufacturers to have 100 percent inspection of solder bumps on chip carriers rather than only being able to measure these under laboratory conditions."

AOT is a new approach to the inspection of PCBs in that it combines optical scanning and test machine fault detection logic. AOT is an innovation approach to the process of finding faults on PCBs. It brings the circuit board manufacturer a concept that has definite benefits over existing fault detection processes such as automatic optical inspection (AOI) and electrical test (ET).

AOI systems have long been used as the tool for sorting good PCB layers from bad ones. Unfortunately, conventional AOI systems have been dogged with the inability to distinguish real alarms from false alarms. This is largely due to the fact that the logic



system that they use is based on either design rules or feature recognition and not on any functional reference of the panel.

AOT systems, on the other hand, start from the basis of knowing the correct connectivity of the layers under inspection — this is the fundamental difference that sets AOT apart from AOI. AOT is the logical step forward for optical inspection. It brings together the process of inspection and ET. AOT gives the manufacturer the chance to use the same integrated database for both inspection and test. Data can be prepared for both ET and the AOT system on the same CAM station using the same issue files and the same connectivity data generation parameters.

Additionally, AOT combines the fault detection logic of conventional probe-type ET machines with optical scanning of inspection machines to result in a viable, accurate fault report for the printed circuits under investigation.

This unique method is based on pattern connectivity as its reference for fault detection and is particularly relevant when analyzing PCBs. In the realm of general electronics, a PCB should be regarded purely and simply as an interconnection device.

Lloyd Doyle designs, manufactures and markets sophisticated AOT systems used in the bare board sector of the PCB manufacturing industry. Founded in 1982, the company has maintained a solid growth pattern throughout the last decade and now supplies its equipment to many of the world's leading PCB manufacturers.

Lloyd Doyle is based in Surrey, United Kingdom where the research and development, design, manufacturing, and after sales support is managed. At this location the company employs leading industry scientists, dedicated design teams and support personnel in addition to the company administration staff. Further Lloyd Doyle facilities placed strategically at the heart of the PCB manufacturing centers around the world provide support, demonstration and sales on a local basis.

Lloyd Doyle Limited may be contacted at Molesey Road, Walton on Thames, Surrey, KT12 3PI England; +44 1932 245000; Fax: +44 1932 220555; Web Site: www.lloyd-doyle.com.