



DEVELOPMENT OF A COMPREHENSIVE IN-LINE QUALITY CONTROL SYSTEM FOR PRINTED CIRCUIT BOARD ASSEMBLIES

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ABSTRACT

Printed Circuit Boards (PCBs) are widely used in electronic goods and many applications that require microprocessor controls. The need to increase the population density of components on PCBs, to make the products ever smaller, has driven the move to more complex surface mount assembly technology. This has led to increased use of area array components such as Ball Grid Arrays (BGAs) and other small footprint devices. As a result there are greater demands on Non Destructive Testing (NDT) examination for quality assurance. Using just one inspection technique, it is not possible to reliably detect all types of PCB assembly defects. In this paper we describe the development of a PCB inspection system that combines four different NDT techniques, based on Automated Optical Imaging (AOI), Digital Radiography (DR), Thermography, and Scanning Acoustic Microscopy (SAM). Each technique has been modularised and the final prototype takes the form of a conveyor belted production line. It is the first time anywhere that the four techniques have been combined together in-line to offer the possibility of 100% defect detection. The application of each NDT technique, the integration, the results and the proof in principle are presented.

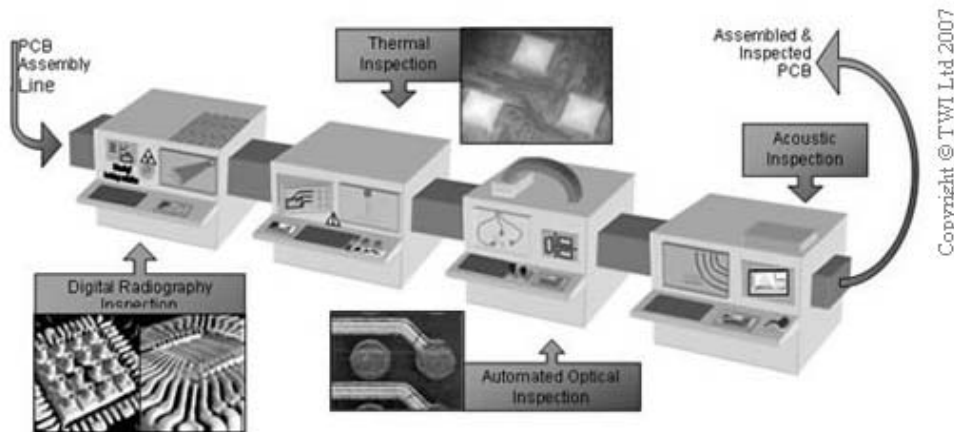


Figure 1 Conceptual drawing of in-line PCB inspection system