This Sheet Has Been Replaced



Measurement and Inspection of Leads on Integrated Circuit Packages

ABSTRACT

A system of optics, cameras and image processor arrangement capable of capturing images of lead tips of object fields resulting in accurate 3 dimensional positions of all the leads on a Integrated Circuit such as a Quad Flat Package (QFP) is disclosed. The system comprises of a telecentric lens attached to a camera working with an arrangement of mirrors and lighting. The telecentric lens and mirror optical layout splits the acquired image into 2 orthogonal viewing fields of the same lead tips of the QFP. The QFP is placed flat on a pedestal, and for any given side of the QFP, the first field views the lead tips from the front. The second field views the lead tips from the bottom of the IC package. Enhanced lead tip images are acquired by a lighting arrangement that casts illumination on the lead tips only. Electronic processing techniques are used to compute the geometry of the leads such as global coplanarity, lead standoff and inspection of other lead defects.