PCB defect detection by DIP

Abstract

one of the major problem in the inspection of PCB is visual and quick inspection of faults it is really hard to find errors manually in a PCB the faults can be caused during the manufacturing process or by extreme exposure. In this paper we have used image processing as the primary tool for defect detection in a printed circuit board. By comparing faulty images with flawless PCB using matlab we have first detected 14 types of defects and then categorized them in four groups each group may have minimum of two defect and maximum of six defects. The algorithm works on a single layer PCB. The categorization of error helps in finding and eradicating the cause of error.

I. INTRODUCTION

Image comparison method is the comparison of two images an Ideal PCB image and a faulty PCB image with errors. It consist of comparing two images pixel by pixel by XOR logic operator. One major requirement for such an arrangement is to have a proper platform to obtain an identical image for both the faulty and the flawless circuit then we can compare the image pixel by pixel. The main difficulty which we have to face in this technique is to find the best comparison between error free PCB image and with error PCB image.

More complicated Idea is feature and template matching but for such a method a large number of template are required. A Model based technique is one which consist of pre-defined models for example the graph matching methods which consist of structural and geometrical properties of image. The major complexity is pattern matching. Pattern attribute hyper graph makes the pattern matching technique more practical but still this method is very time consuming. DRC(Design rule checking) approach is used essentially to verify the width of the conductor and insulator .DRC checks to see if all the spaces and pattern are according to the standard and design rule. In this procedure an algorithm is applied directly to an image so it is relatively easy as compare to the other approach. This means it does not required any mechanical part or other complex part to get the image with errors. However this method has a drawback that it is very time

consuming and great processing power is required to fulfill the human requirements of completing the task in time

Block Diagram :