

Comparison of Printed Circuit Board Fabricated by using Conventional Method and Laser Cutting Method

DALP Karunarathne^{1#}, WSP Fernando¹, PSH Pallemulla¹ and MKAJ Maldeniya²

¹*Department of Mechanical Engineering, Faculty of Engineering,
General Sir John Kotelawala Defence University, Ratmalana, Sri Lanka*

²*Department of Mathematics, Faculty of Engineering,
General Sir John Kotelawala Defence University, Ratmalana, Sri Lanka*

#lahirukarunarathna@gmail.com

There are multiple methods of manufacturing printed circuit boards (PCB). The approach used by electronic enthusiasts is ironing the circuit from the glossy paper onto the copper plate (the homemade method). Industrial PCB manufacturers use laser cutting or computerized numerical control milling to cut the pathways, thus etching the circuit on the board. The former is time-consuming and the latter carries the risk of damaging the board during the manufacturing process, in addition to several other drawbacks. The approach that is presented in this paper avoids these disadvantages. In the proposed method, a polyvinyl chloride sticker is pasted on the copper board and unwanted sections of the sticker are removed by using laser cutting. Subsequently, the copper board with the sticker is immersed in a ferric chloride solution, washed off and the remaining parts of the sticker are removed. The advantages of this approach are the capability of accurately obtaining fine tracks (of 30 mil in width) and being comparatively less time-consuming than other methods used by electronics enthusiasts. In this paper, the procedure for making a PCB with the proposed method is laid out. Then, the function and design of a low-power laser cutter to accomplish the former is discussed.

Keywords: *printed circuit board, laser cutting, polyvinyl chloride sticker*