



# 8 MAIN FACTORS AFFECTING PCB FABRICATION COST

Several factors can influence the cost of PCB fabrication. By identifying the stages in production and processing where costs may increase allows you to make reasonable, cost-effective decisions that ensure the quality of your products while minimizing costs.

## 1. Board Material Choice

The materials used in a circuit board will invariably affect its cost. Standard PCBs are laminated with FR4 material, but this will not suffice for boards manufactured for high-intensity uses, such as those common in the aerospace and fuel industries. As a rule of thumb, operations that involve higher frequencies require materials of a higher grade than standard FR4. As such, the materials used in a microwave PCB could be 10 times more costly than the materials used for the board in a calculator or other handheld device.

## 2. PCB Size

The size and shape of your PCB can impact its costs as they increase. Expanding the PCB's size will require more materials and time to manufacture the final product, leading to rising costs. PCB price will increase in proportion to the board's surface area, which you can use to calculate how much extra your product will cost as you expand beyond the standard sizing.

## 3. Layer Count

Like the size and material usage, you can expect the price to rise as you add more layers to your PCB. Costs increase for additional layers for many reasons. When you add more layers, you will need more materials for each layer, and it will take longer to produce with extra etching and bonding steps.

## 4. Effective Utilization of Materials

Effective utilization of materials correlates closely to size and spacing. When you choose a PCB with a smaller size, you will use fewer materials, making it a more cost-effective option. However, even if you elect to use a larger size, you can cut costs on materials by effectively using your available space to minimize waste and only use what you need. Finding an arrangement that optimizes your space and size can help ensure you are using only what you need.

## 5. Surface Finishes

Depending on the surface finish you choose for your PCB, costs can fluctuate. You can find standard and basic finishes, like OSP and HASL, which are more cost-effective and still offer decent solderability. However, some other finishes can lead to increases in price. LF HASL,

Imm Ag, Imm SN and ENIG each vary in terms of price, with LF HASL being the most cost-effective and ENIG being the most expensive. Further, prices will change depending on how many layers you need for each material. Choosing a more cost-effective surface finish option can help you cut costs for your PCB fabrication.

## **6. Complexity**

The further your PCB strays from standard and conventional board technology, the higher your costs. More complex configurations and designs will require more time to assemble with extra steps.

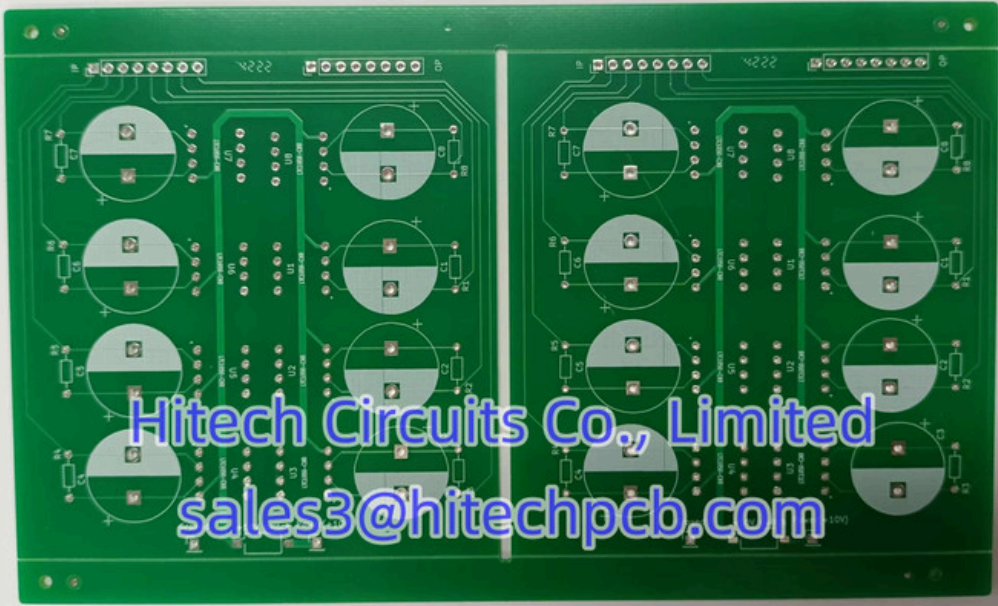
## **7. Copper Foil Weights**

The weight of your copper foils relates closely to using materials effectively. Thicker copper is more expensive and comes with additional challenges and costs. You will likely need to use more prepreg in your processing steps to fill gaps between copper. Since thicker copper is heavier, you might also experience higher transportation costs.

## **8. Customer's quality acceptance criteria**

Common acceptance standards for PCB include IPC2, IPC3, enterprise standards, military standards, etc. The higher the standard, the stricter the quality control will be. The level of customer requirements directly impacts the yield rates for PCB manufacturers. For instance, if an FPC is produced per IPC-A-6013 Class 1 standards requiring a 98% pass rate, the cost would be higher than for Class 3 with only a 90% pass rate.

Understanding all of these factors can help you further understand how cost affects price. Then, you can ultimately balance the cost and functionality of your PCB. Hitech can be your ideal PCB supplier, we are committed to providing cost-effective prices and good quality with fast delivery time. If you have any needs for PCB, please feel free to contact us. Any questions, please email [sales3@hitechpcb.com](mailto:sales3@hitechpcb.com). For more PCB information, please visit <https://hitechcircuits.com/>



Hitech Circuits Co., Limited  
sales3@hitechpcb.com